# SECTION I - BARRIER



DELAWARE
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS (2004)

SHT. 1 OF 5

09/28/2004

# SECTION I - BARRIER (CONT'D)



# SECTION II - CURB & GUTTER



# SECTION III - DRAINAGE

# SECTION III - DRAINAGE (CONT'D)



# SECTION IV - EROSION

# SECTION V - MISCELLANEOUS



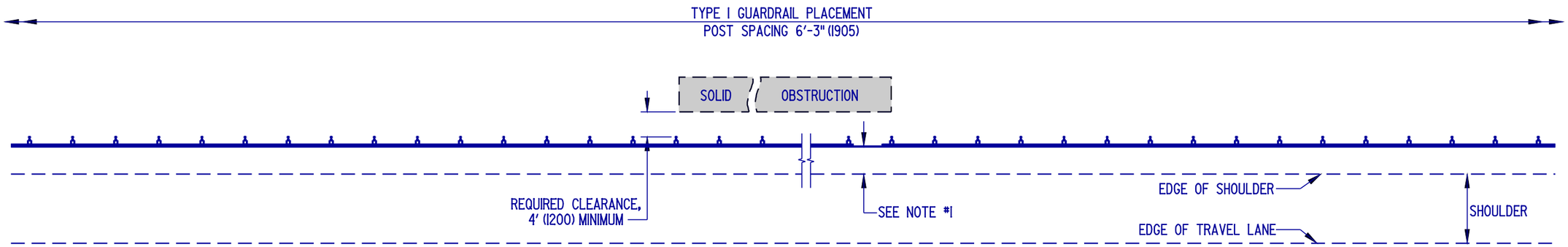
# SECTION VI - PAVEMENT



# SECTION VII - TRAFFIC

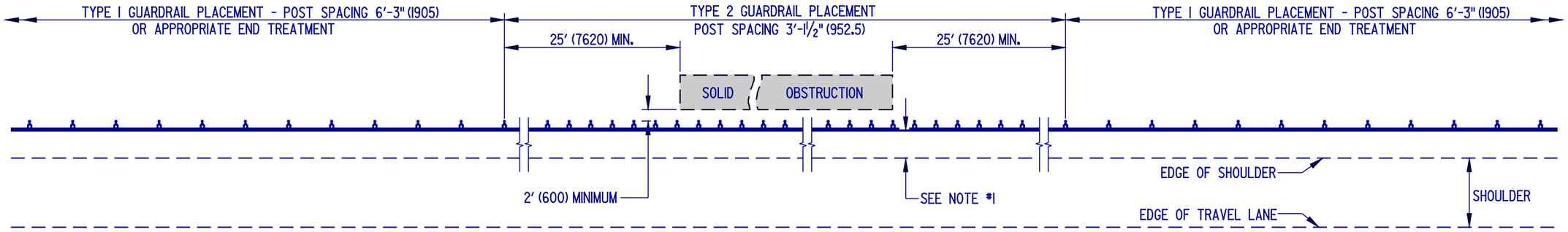
# SECTION VII - TRAFFIC (CONT'D)

SCALE : N.T.S.



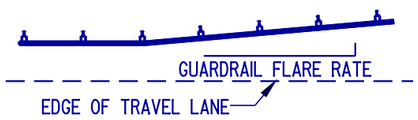

## TYPE I GUARDRAIL

TYPICAL GUARDRAIL TREATMENT
WHEN THE REQUIRED 4' (1200) CLEARANCE TO OBSTRUCTION IS AVAILABLE

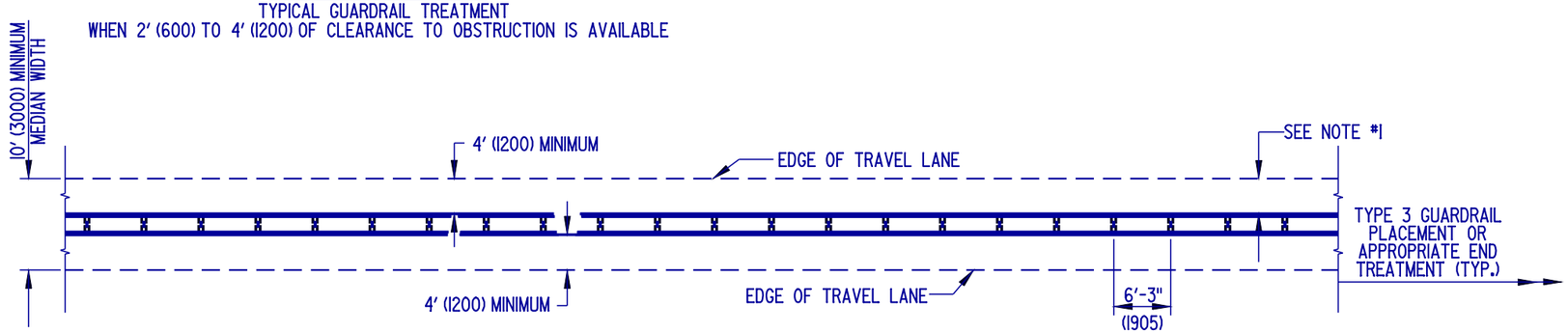



## TYPE 2 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT
WHEN 2' (600) TO 4' (1200) OF CLEARANCE TO OBSTRUCTION IS AVAILABLE




| FLARE RATES | |
|---|---|
| DESIGN SPEED | FLARE RATE |
| 70 MPH (110 km/h) | 15:1 |
| 60 MPH (100 km/h) | 14:1 |
| 55 MPH (90 km/h) | 12:1 |
| 50 MPH (80 km/h) | 11:1 |
| 45 MPH (70 km/h) | 10:1 |
| 40 MPH (60 km/h) | 9:1 |
| 30 MPH (50 km/h) | 7:1 |




## TYPE 3 GUARDRAIL

TYPICAL GUARDRAIL TREATMENT WHEN A MINIMUM OF
10' (3000) IS AVAILABLE FOR MEDIAN

NOTES : 1). THE DISTANCE FROM THE EDGE OF THE TRAVEL LANE OR SHOULDER TO THE FACE OF GUARDRAIL SHOULD BE MAXIMIZED. THIS AREA SHALL BE GRADED 10:1 OR FLATTER.

2). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.

DELAWARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL APPLICATIONS

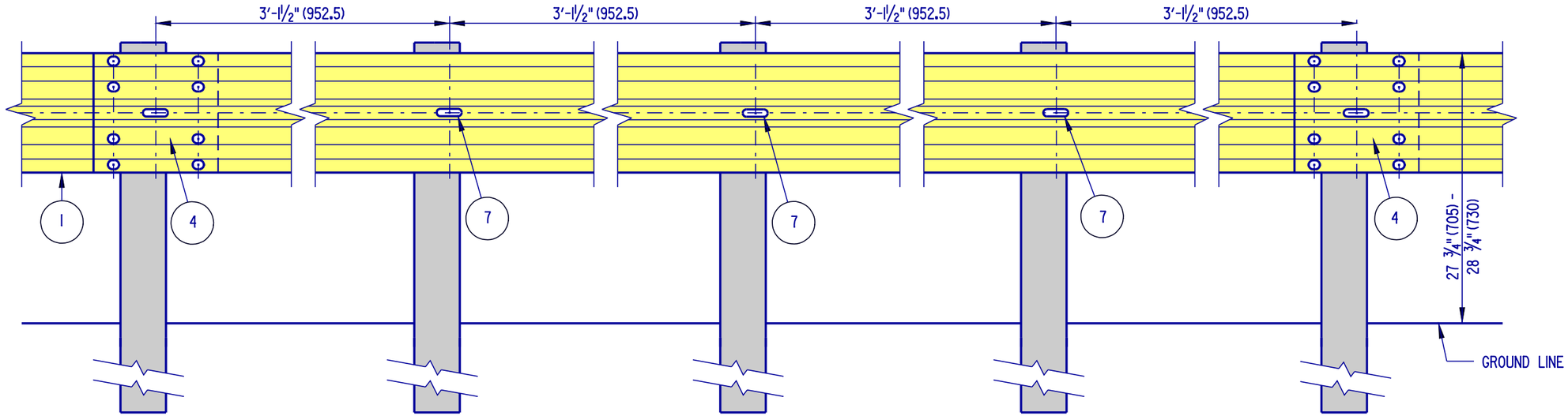
STANDARD NO. B-1 (2004) | SHT. 1 OF 6

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

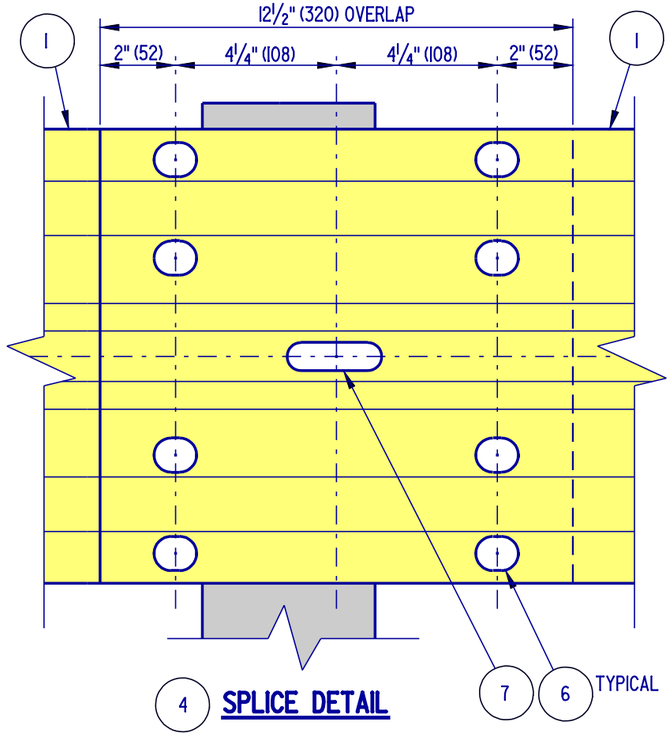
RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

12/08/2004

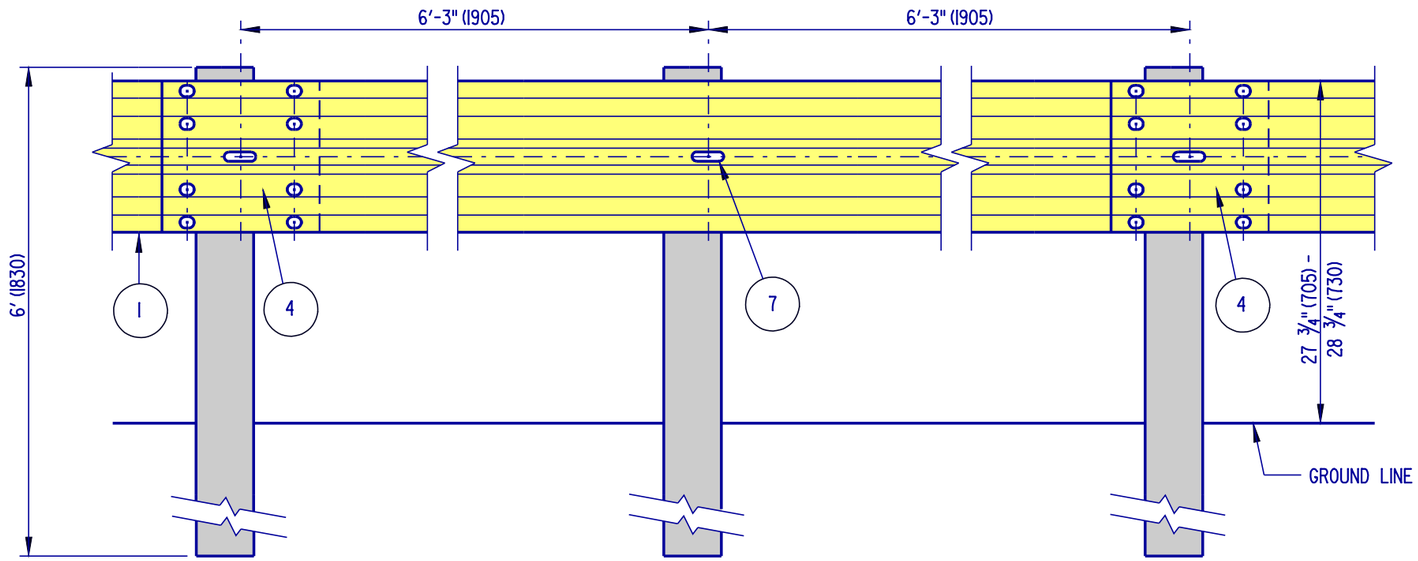
SCALE : N.T.S.




## TYPE 2




4 **SPLICE DETAIL**



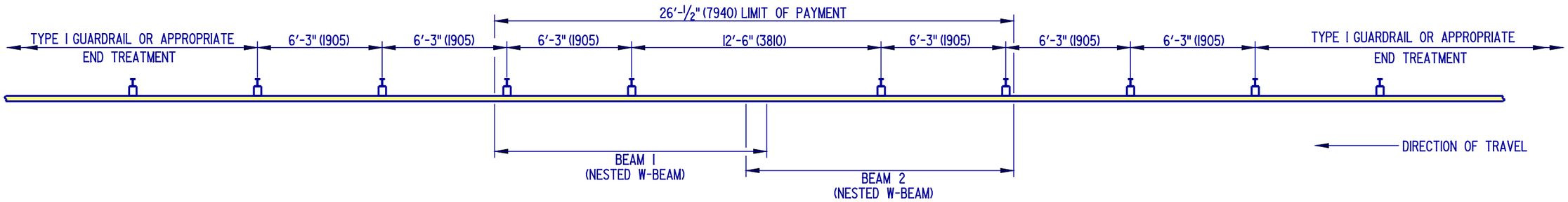

## TYPE 1 OR 3

**NOTE :** OVERLAP W-BEAMS IN DIRECTION OF TRAVEL.

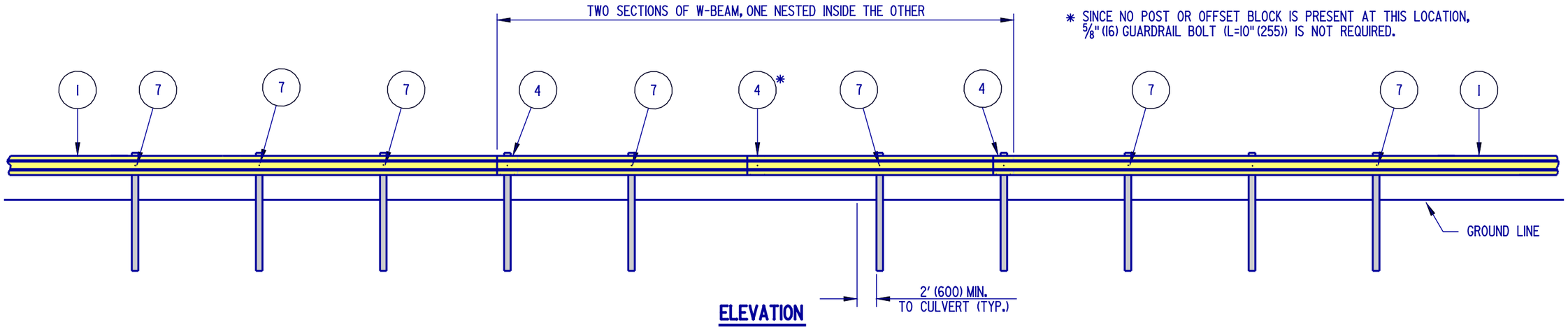
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | GUARDRAIL APPLICATIONS | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-1 (2004) SHT. 2 OF 6 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

08/24/2004

SCALE : N.T.S.




## PLAN



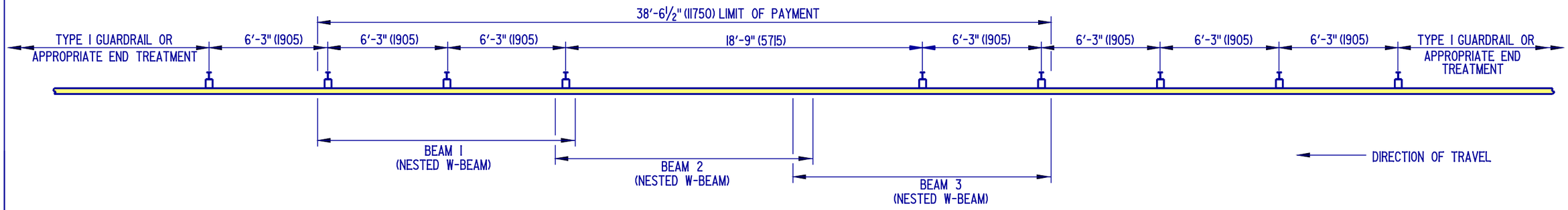

## ELEVATION

NOTES :1). ALL W-BEAMS ARE 13'-6 1/2" (4130) IN LENGTH.
2). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.

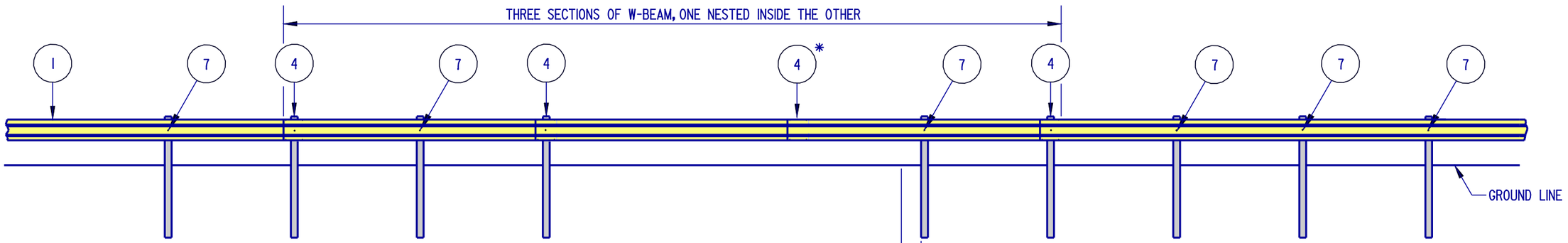
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | GUARDRAIL OVER CULVERTS, TYPE 1 | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-2 (2004) SHT. 1 OF 1 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

12/08/2004

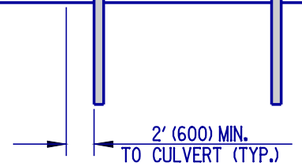
SCALE : N.T.S.




## PLAN




## ELEVATION



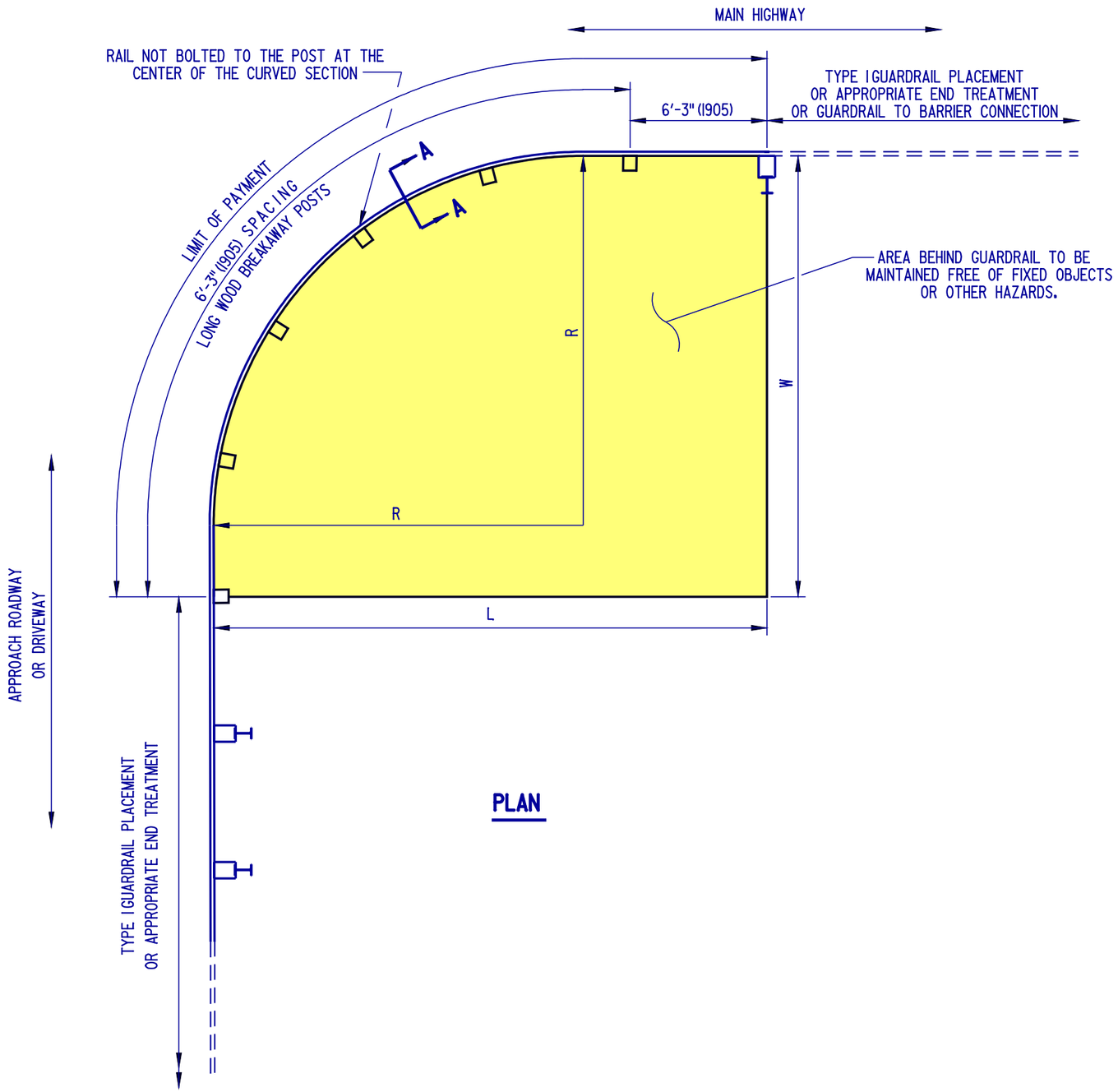

* SINCE NO POST OR OFFSET BLOCK IS PRESENT AT THIS LOCATION, ⅝" (16) GUARDRAIL BOLT (L=10" (255)) IS NOT REQUIRED.

NOTES : 1). ALL W-BEAMS ARE 13'-6½" (4130) IN LENGTH.
2). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.

| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | GUARDRAIL OVER CULVERTS, TYPE 2 | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-3 (2004) SHT. 1 OF 1 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

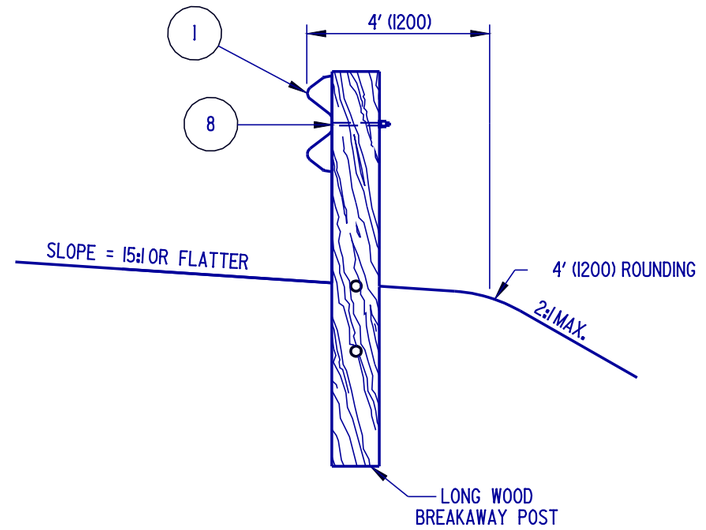
12/08/2004

SCALE : N.T.S.




**PLAN**

| RADIUS | MIN. REQUIRED AREA FREE OF FIXED OBJECTS |
|---|---|
| | L x W |
| 8'-6" (2600) | 25' x 15' (7600 x 4500) |
| 17'-0" (5200) | 30' x 15' (9144 x 4500) |
| 25'-6" (7800) | 40' x 20' (1200 x 6000) |
| 35'-0" (10700) | 50' x 20' (15200 x 6000) |




**SECTION A-A**

NOTES: 1). NO WASHERS ARE USED ON THE RAIL SIDE OF THE LONG WOOD BREAKAWAY POSTS.

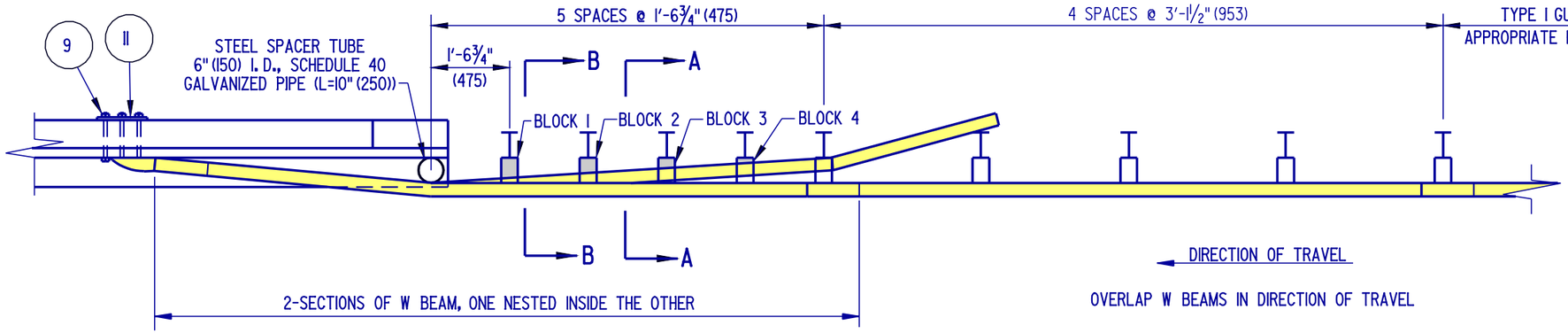
2). THE CURVED GUARDRAIL SECTION SHALL BE SHOP BENT.

3). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.

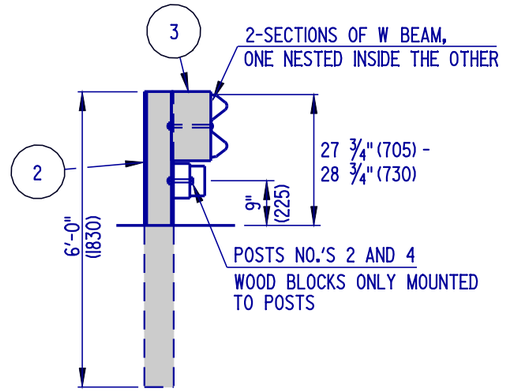
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | CURVED GUARDRAIL SECTION | APPROVED Carolann Wicks (CHIEF ENGINEER) 1/10/05 (DATE) |
| | STANDARD NO. B-4 (2004) SHT. 1 OF 1 | RECOMMENDED Dennis M. Office (DESIGN ENGINEER) 1/3/05 (DATE) |

12/08/2004

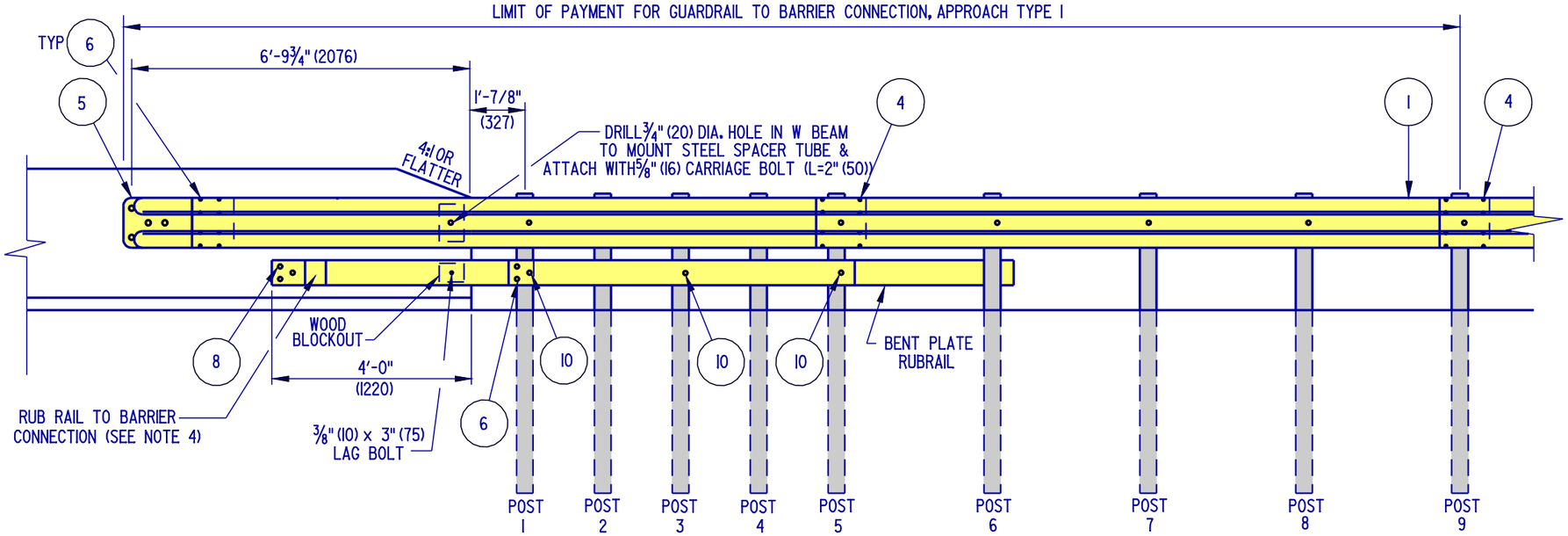
SCALE : N.T.S.



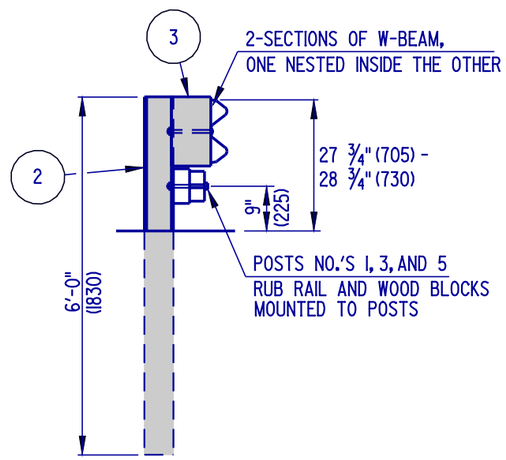

## PLAN




## SECTION A-A




## ELEVATION




## SECTION B-B

NOTES:
1). W BEAM IS NOT BOLTED TO POSTS AT POSTS 2 THROUGH 4.
2). RUB RAIL IS NOT BOLTED AT POSTS 2 AND 4.
3). POSTS 1 THROUGH 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER WOOD BLOCKS AND/OR RUBRAIL AND WOOD BLOCK.
4). USE APPROPRIATE EPOXY BOLT ANCHORS TO REDUCE THE CHANCE OF SPLITTING THE CONCRETE. PLACE STEEL WASHERS (FOR ⅝" (16) BOLT) BETWEEN BOLT HEADS AND RUB RAIL.
5). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.

**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

**GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1**

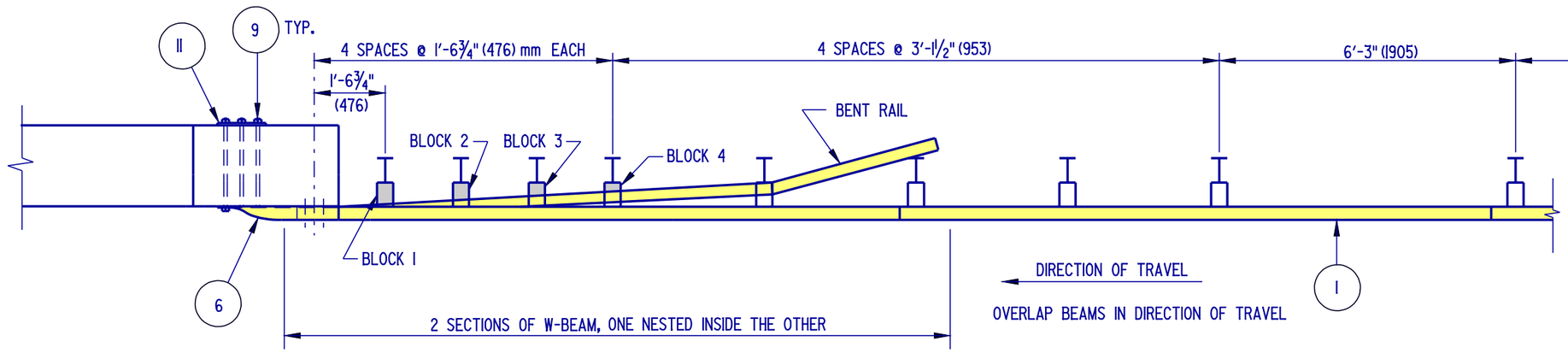
**STANDARD NO. B-7 (2004)** | **SHT. 1 OF 3**

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

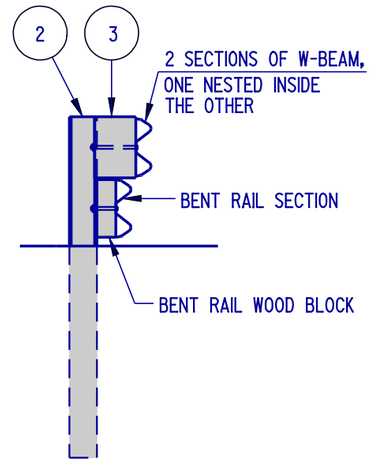
RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

12/08/2004

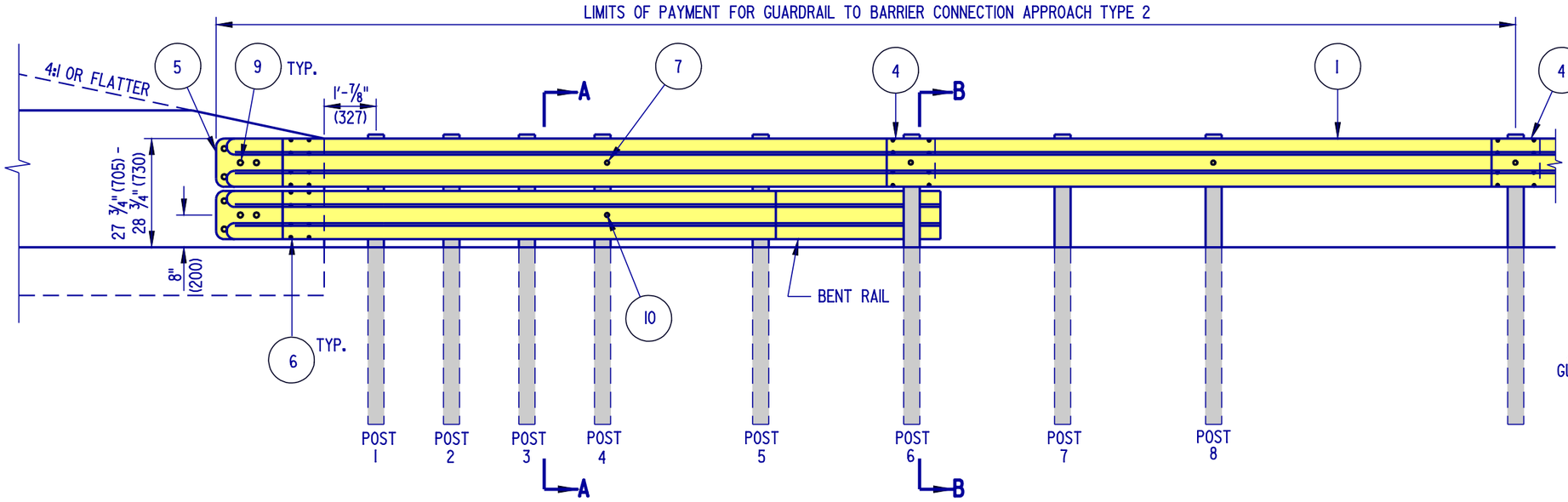
SCALE : N.T.S.



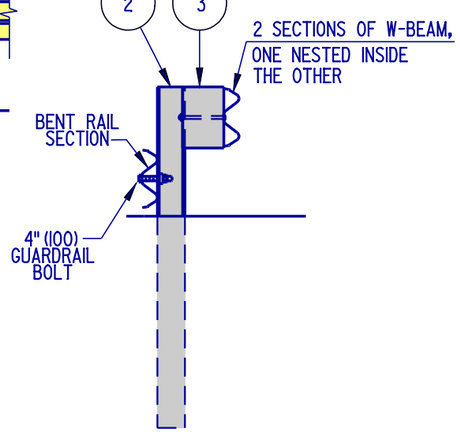

## PLAN




## SECTION A-A




## ELEVATION



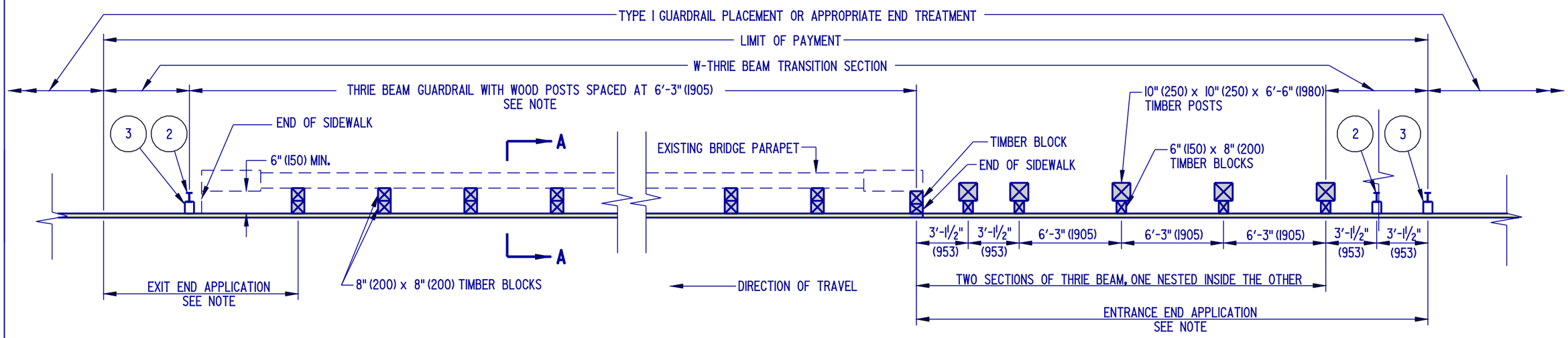

## SECTION B-B

NOTES :
1). CURB SHALL NOT BE USED AT THE FACE OF RAIL WITHIN THE LIMITS OF THIS INSTALLATION.
2). POSTS 1, 2, 3, 4, AND 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH WOOD BLOCKS AND/OR BENT RAIL.
3). DO NOT ATTACH RAILS TO POSTS 1, 2, 3, 5, OR 7.
5). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6). BENT RAIL MAY BE SHOP BENT TO FACILITATE INSTALLATION OR MAY BE FIELD BENT USING HEAT.
7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTORS TO PARAPET.
8). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
9). WHEN PLACED OVER CURB (MIN 8" (200) HIGH), BOTTOM RAIL CAN BE ELIMINATED.

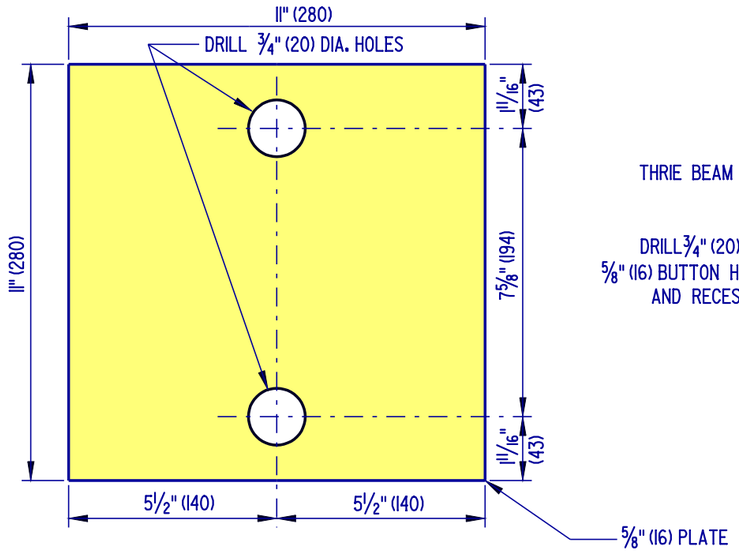
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | GUARDRAIL TO BARRER CONNECTION, APPROACH TYPE 2 | APPROVED Carolann Wicks (CHIEF ENGINEER) 1/10/05 (DATE) |
| | STANDARD NO. B-8 (2004) SHT. 1 OF 2 | RECOMMENDED (DESIGN ENGINEER) 1/3/05 (DATE) |

12/08/2004

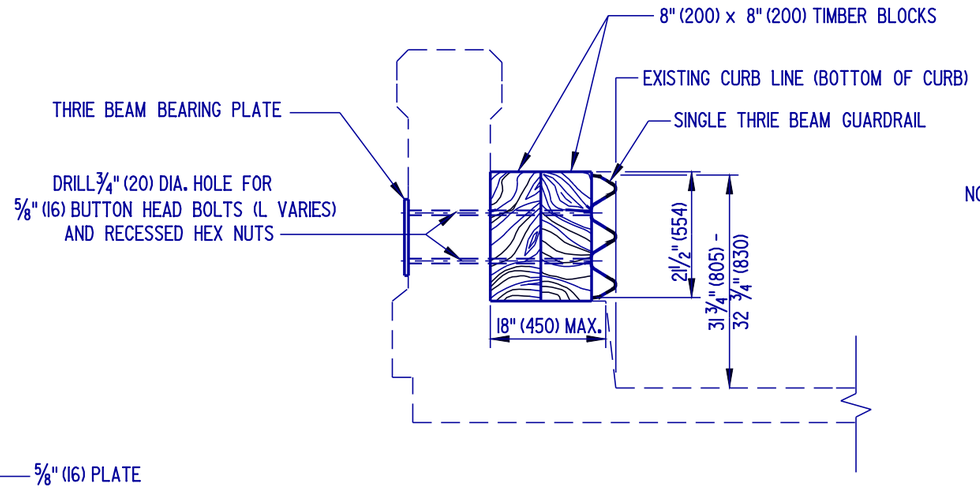
SCALE : N.T.S.




## PLAN




## THRIE BEAM BEARING PLATE DETAIL




## SECTION A-A

NOTES:
1). THIS INSTALLATION SHALL BE USED WHEN THE EXISTING SIDEWALK IS 18" (450) OR LESS.
2). USE A THRIE BEAM EXPANSION SECTION AT BRIDGE EXPANSION JOINTS.
3). PLACE GUARDRAIL REFLECTOR IN THE UPPER VALLEY OF THE THRIE BEAM EVERY FIFTH POST.
4). TIMBER BLOCK THICKNESS SHALL BE ADJUSTED TO ALLOW FACE OF THE THRIE BEAM TO BE FLUSH WITH BOTTOM OF CURB (MINIMUM THICKNESS SHALL BE 4" (100)).
5). THE EXIT END APPLICATION SHALL BE USED ONLY ON DIVIDED HIGHWAYS. FOR ALL OTHER SITUATIONS, THE ENTRANCE END APPLICATION SHALL BE USED ON BOTH ENDS OF THE BRIDGE PARAPET.
6). SPACING OF WOOD POSTS MAY NEED TO BE REDUCED TO ACCOMMODATE LINING UP POSTS AT THE END OF THE PARAPET.

DELAWARE
DEPARTMENT OF TRANSPORTATION

BRIDGE RAIL RETROFIT, TYPE 1

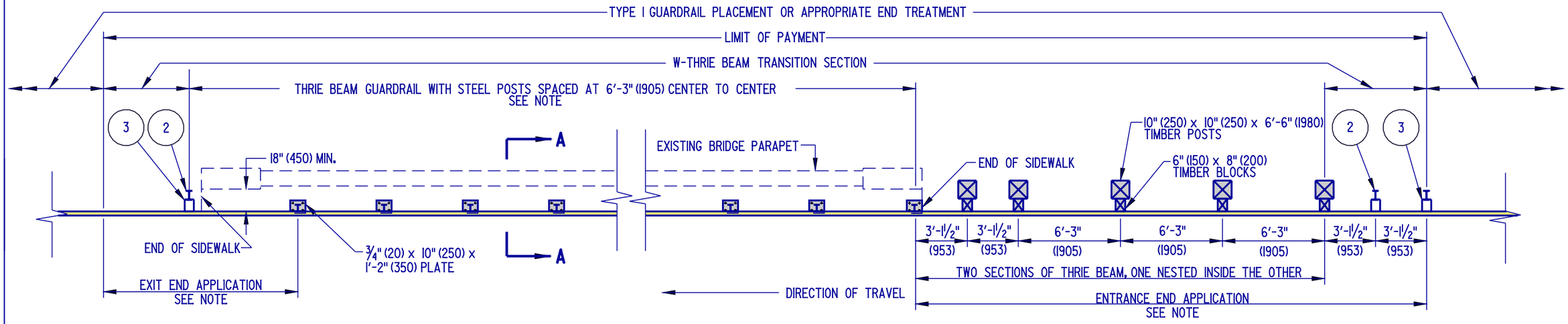
STANDARD NO. B-10 (2004) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

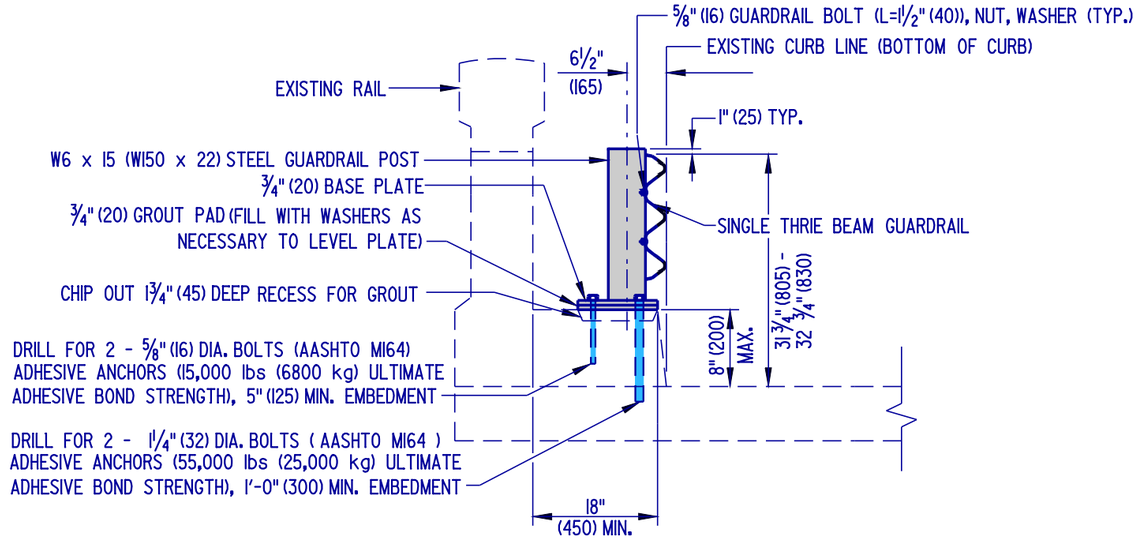
RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

12/08/2004

SCALE : N.T.S.




## PLAN




## SECTION A-A

NOTES:
1). THIS INSTALLATION SHALL BE USED WHEN THE EXISTING SIDEWALK IS 18" (450) OR WIDER, AND DEAD LOAD CONSIDERATIONS ARE A CONCERN WHEN USING BRIDGE RAIL RETROFIT, TYPE 3.
2). ADHESIVE ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS AND SHALL BE GALVANIZED.
3). USE A THRIE BEAM EXPANSION SECTION AT BRIDGE EXPANSION JOINTS.
4). PLACE GUARDRAIL REFLECTOR IN THE UPPER VALLEY OF THE THRIE BEAM EVERY FIFTH POST.
5). THE EXIT END APPLICATION SHALL BE USED ONLY ON DIVIDED HIGHWAYS. FOR ALL OTHER SITUATIONS, THE ENTRANCE END APPLICATION SHALL BE USED ON BOTH ENDS OF THE BRIDGE PARAPET.
6). SPACING OF STEEL POSTS MAY NEED TO BE REDUCED TO ACCOMMODATE LINING UP POSTS AT THE END OF THE PARAPET.

DELAWARE
DEPARTMENT OF TRANSPORTATION

BRIDGE RAIL RETROFIT, TYPE 2

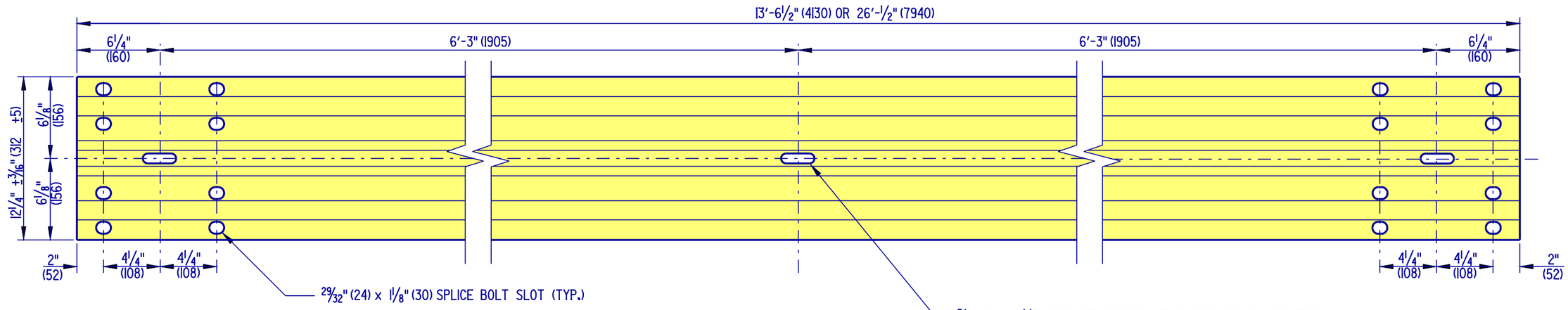
STANDARD NO. B-11 (2004) | SHT. 1 OF 4

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

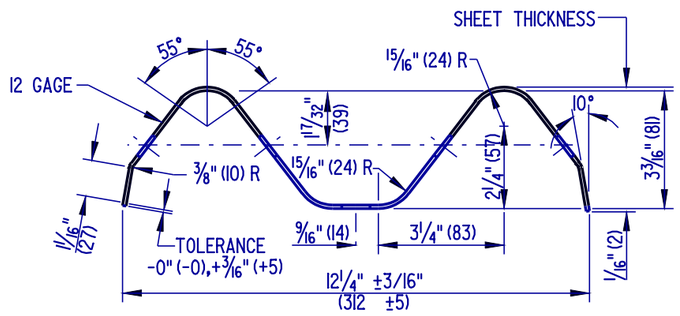
12/08/2004

SCALE : N.T.S.




## W-BEAM ELEVATION

1



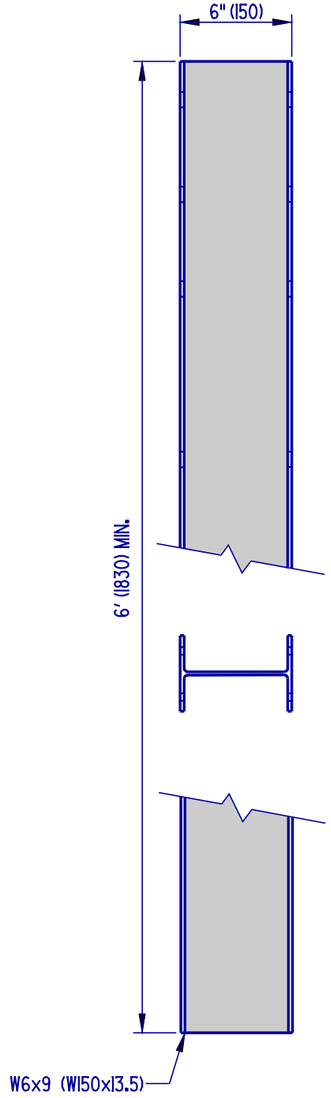

## W-BEAM SECTION

**NOTES:** 1). TWO ADDITIONAL ¾" (20) x 2½" (65) SLOTS SHALL BE PROVIDED AT 6'-3" (1905) SPACING FOR BEAM LENGTH OF 26'-½" (7940).

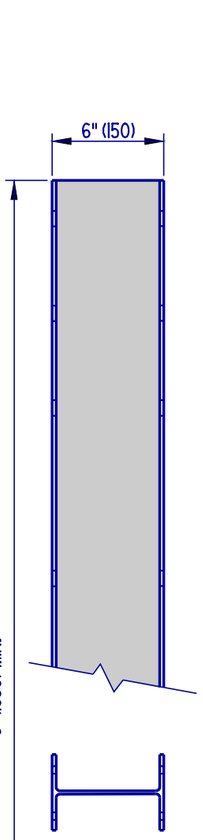
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-13 (2004) SHT. 1 OF 13 | RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE |

09/21/2004

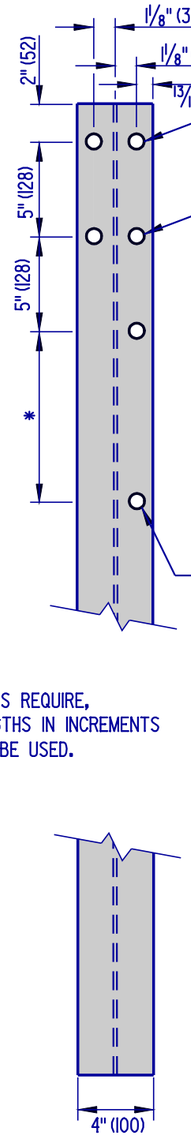
SCALE : N.T.S.




SIDE

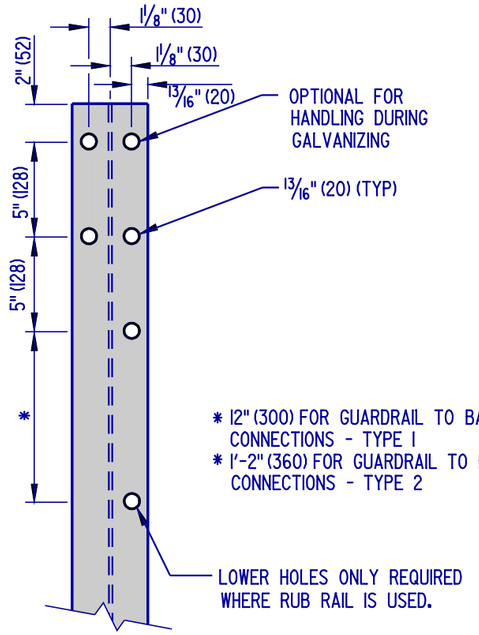


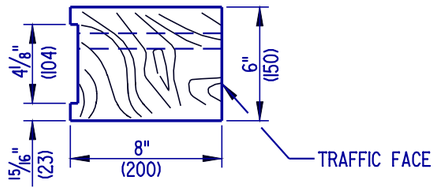
NOTE:
WHERE CONDITIONS REQUIRE,
ALTERNATE LENGTHS IN INCREMENTS
OF 6" (150) MAY BE USED.



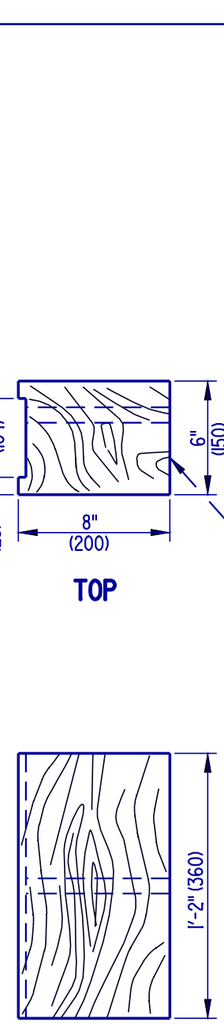

FRONT

POST (2)




TOP




SIDE


FRONT

OFFSET BLOCK (3)

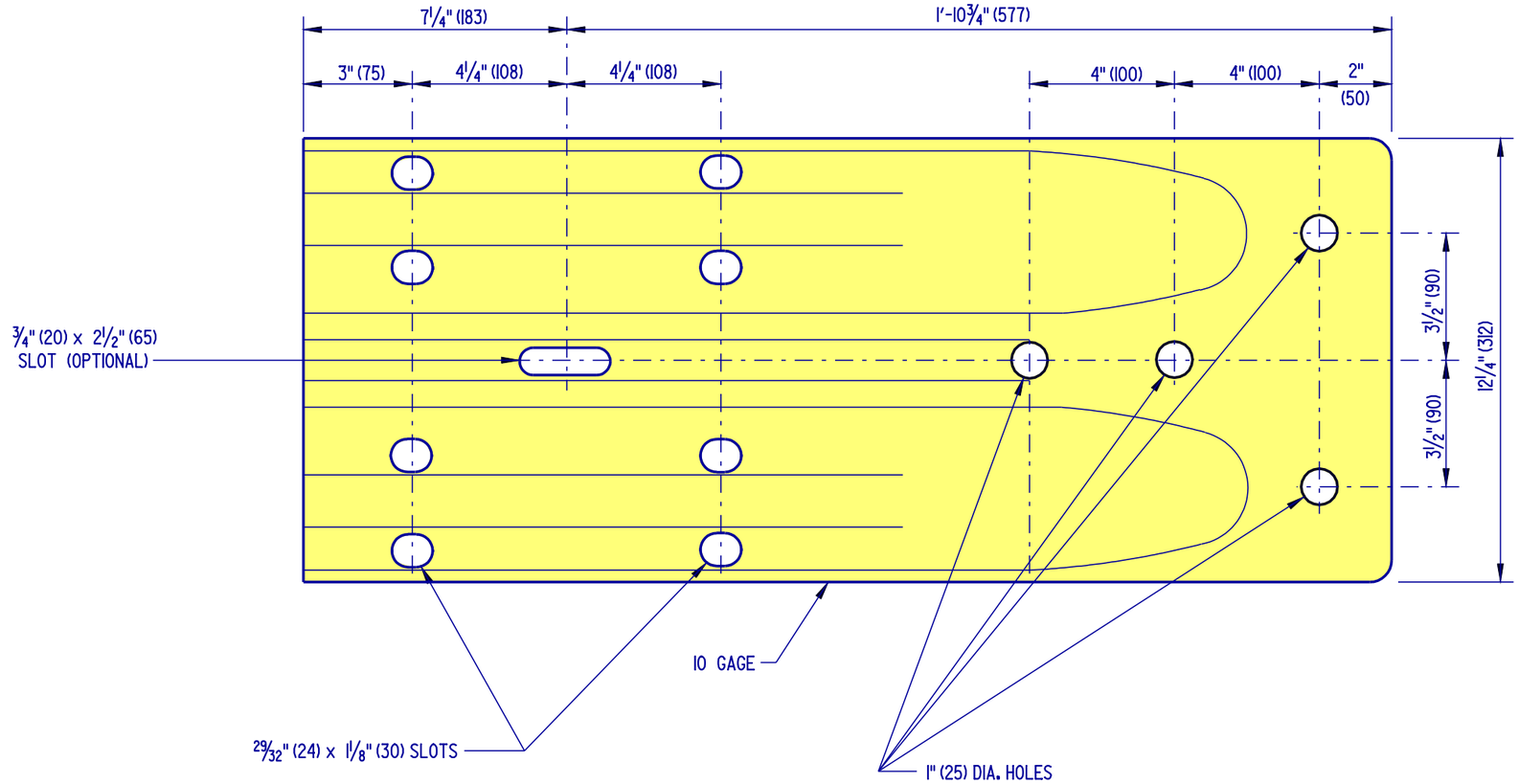
NOTE : ALL HOLES SHALL BE 13/16" (20) DIA. BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.

## W-BEAM STEEL POST AND WOOD OFFSET BLOCK

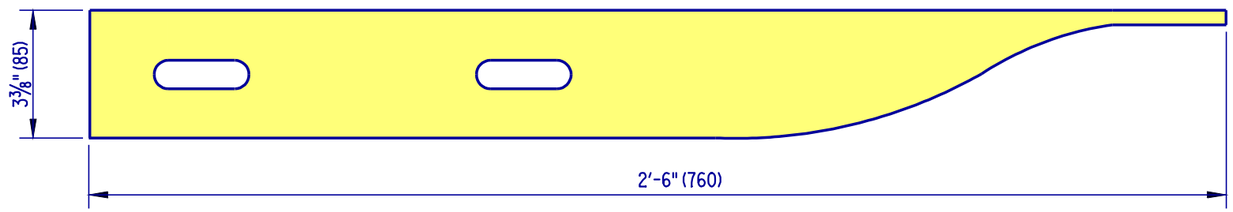
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks (CHIEF ENGINEER) 1/10/05 (DATE) |
| | STANDARD NO. B-13 (2004) | SHT. 2 OF 13 | RECOMMENDED Dennis M. Office (DESIGN ENGINEER) 1/3/05 (DATE) |

09/28/2004

SCALE : N.T.S.




## ELEVATION



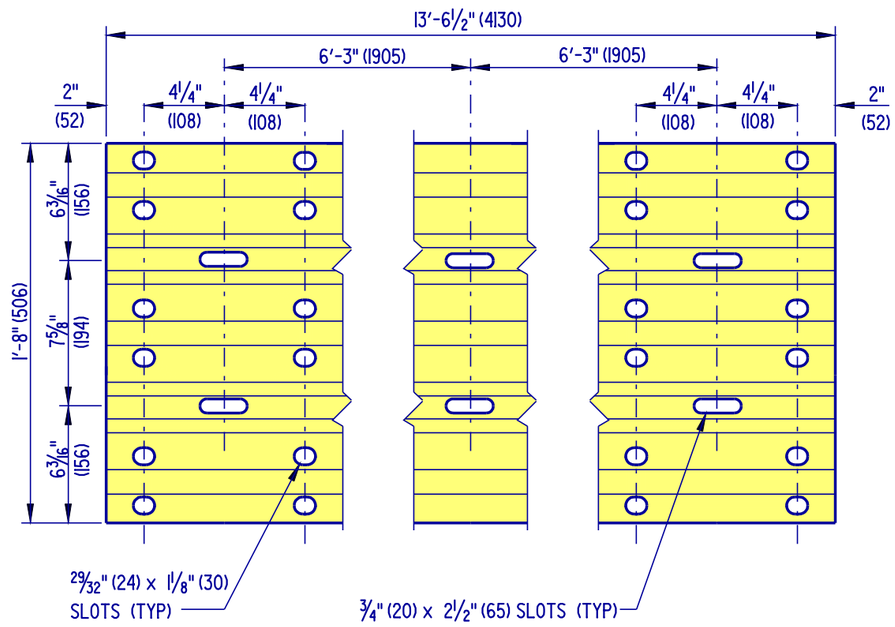

## PLAN

## W-BEAM TERMINAL CONNECTOR (5)

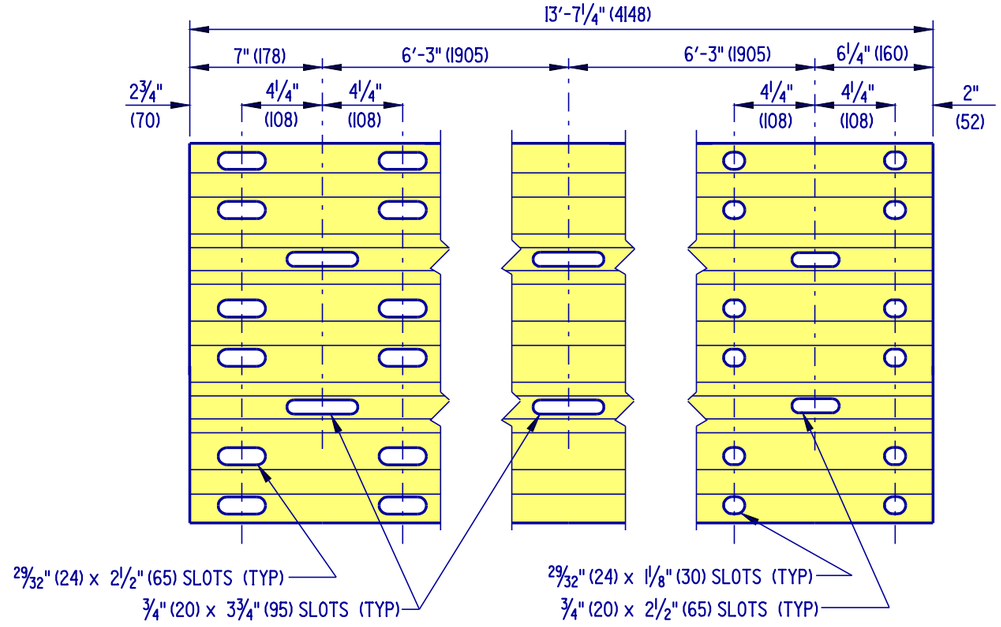
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. B-13 (2004) | SHT. 3 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/27/2004

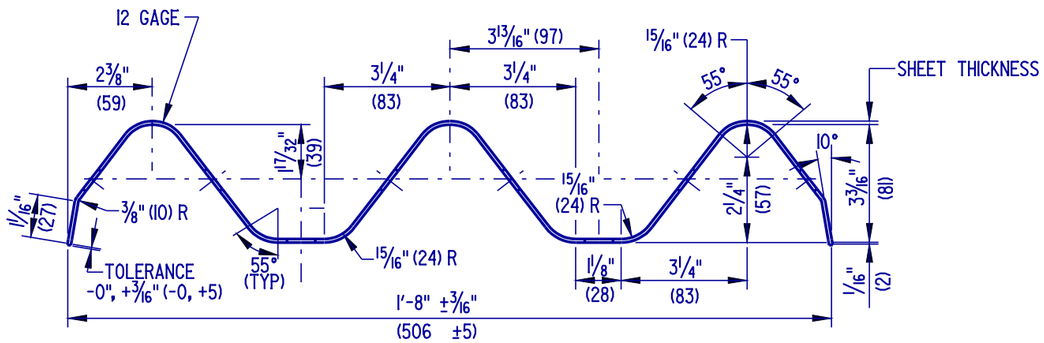
SCALE : N.T.S.




## THRIE BEAM ELEVATION




## THRIE BEAM EXPANSION ELEMENT

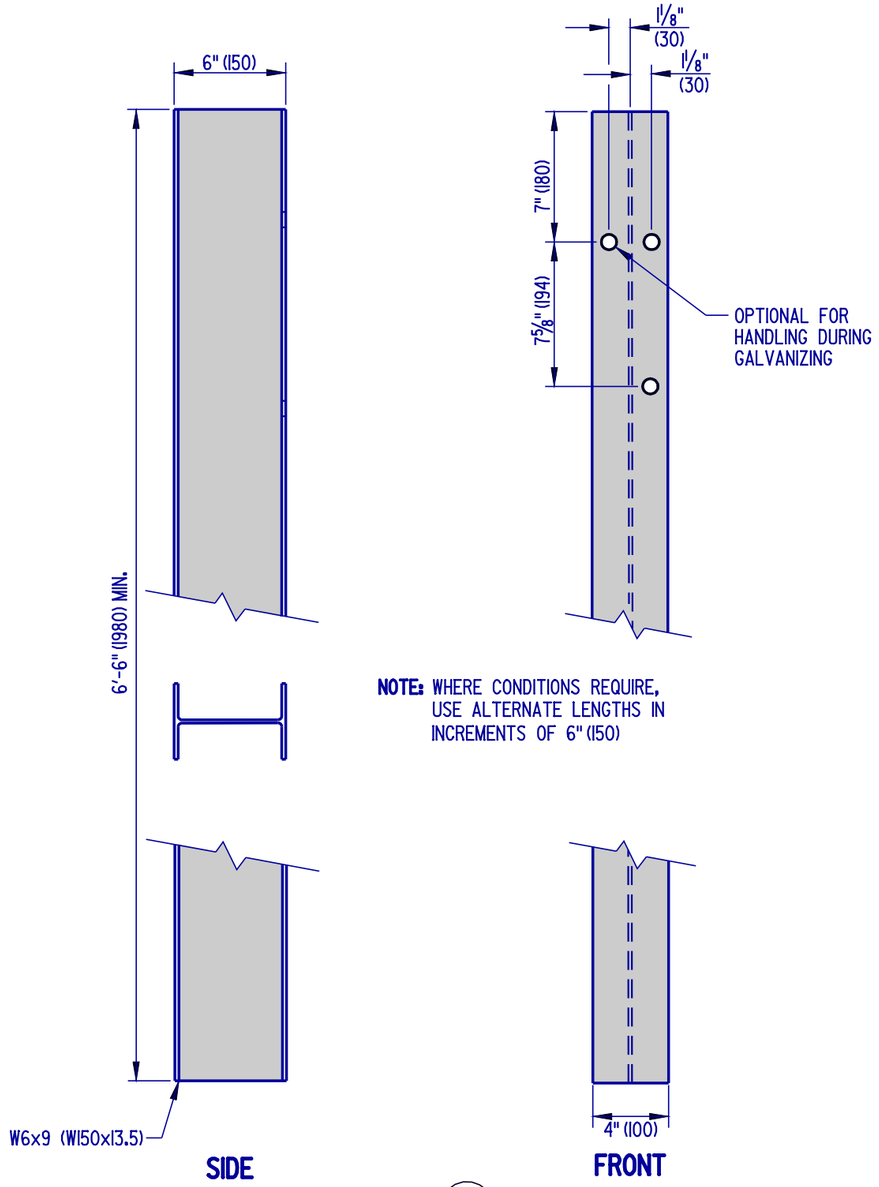



## THRIE BEAM SECTION

| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-13 (2004) | SHT. 4 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

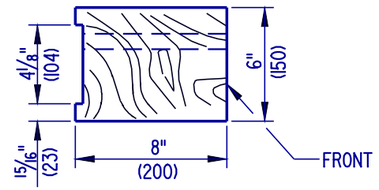
09/28/2004

SCALE : N.T.S.

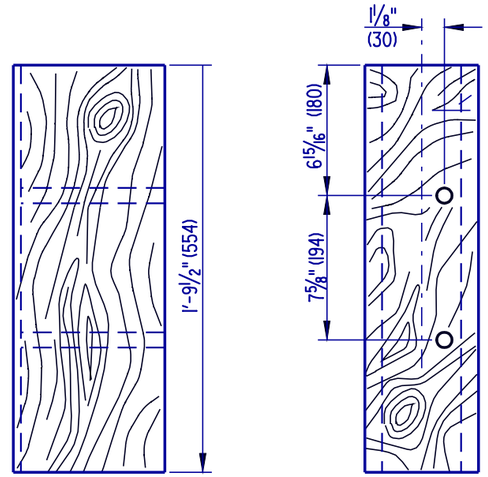



**NOTE:** WHERE CONDITIONS REQUIRE, USE ALTERNATE LENGTHS IN INCREMENTS OF 6" (150)

## POST (2)




**TOP**




## OFFSET BLOCK (3)

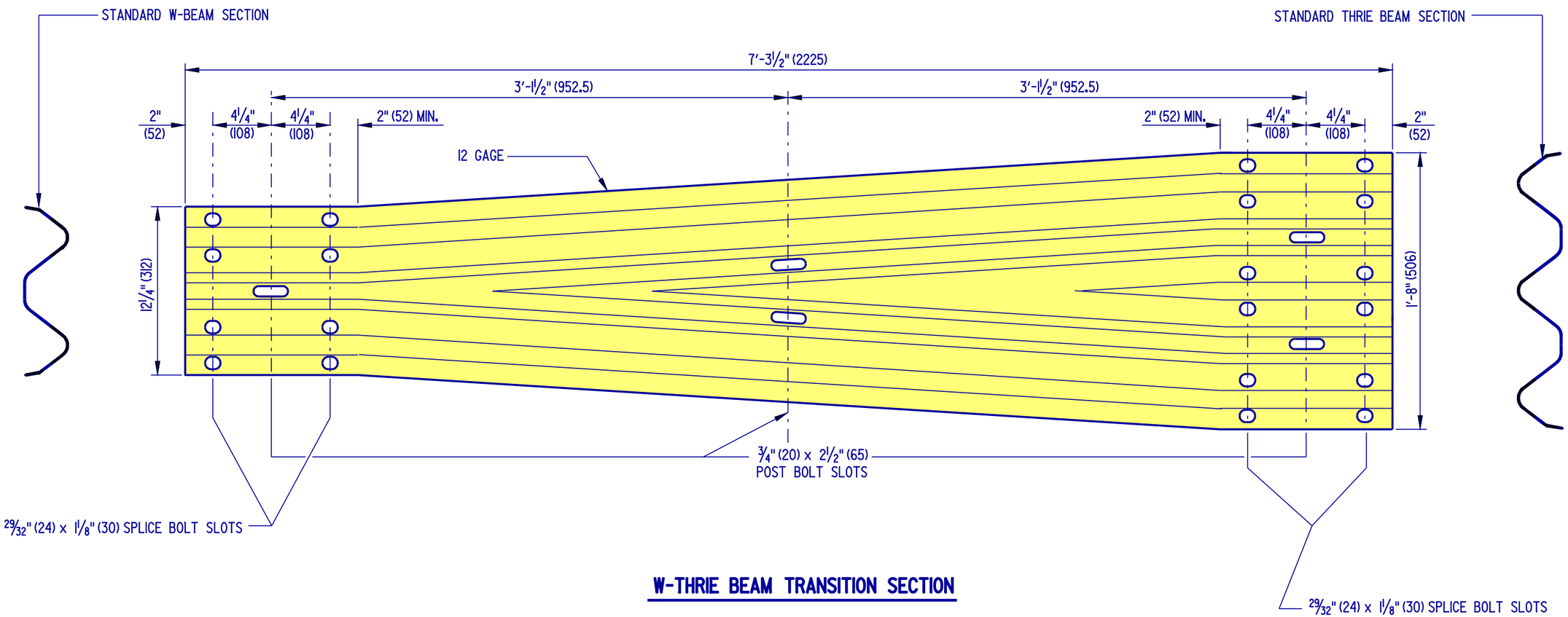
## THRIE BEAM STEEL POST AND WOOD OFFSET BLOCK

**NOTE :**
ALL HOLES SHALL BE 13/16" (20) DIA. BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.

| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. B-13 (2004) | SHT. 5 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/28/2004

SCALE : N.T.S.




## W-THRIE BEAM TRANSITION SECTION

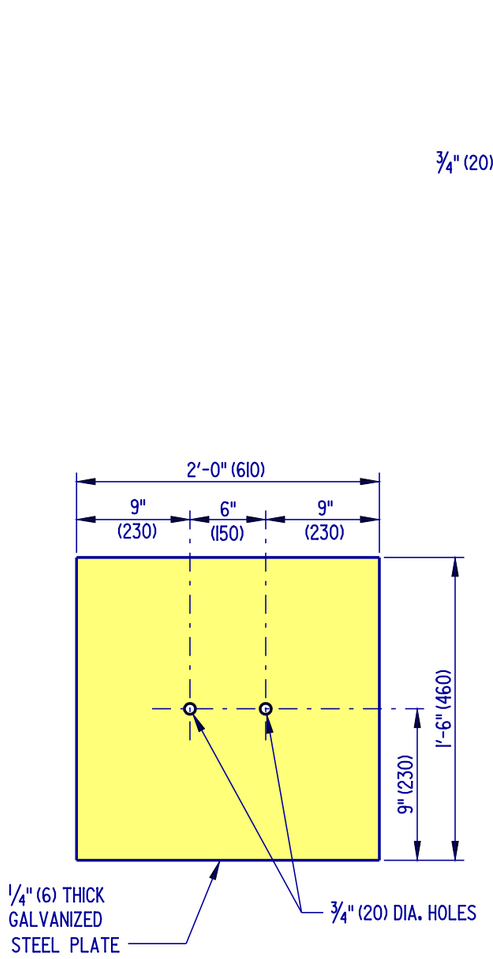
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-13 (2004) | SHT. 6 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/10/2004

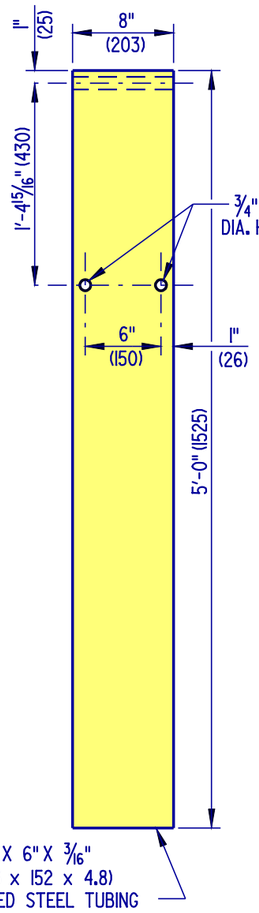
SCALE : N.T.S.

**NOTES :** 1). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

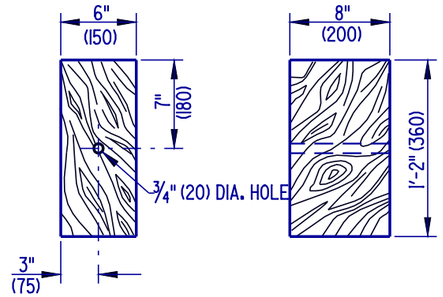
2). ALL WOOD SIZES ARE NOMINAL DIMENSIONS.



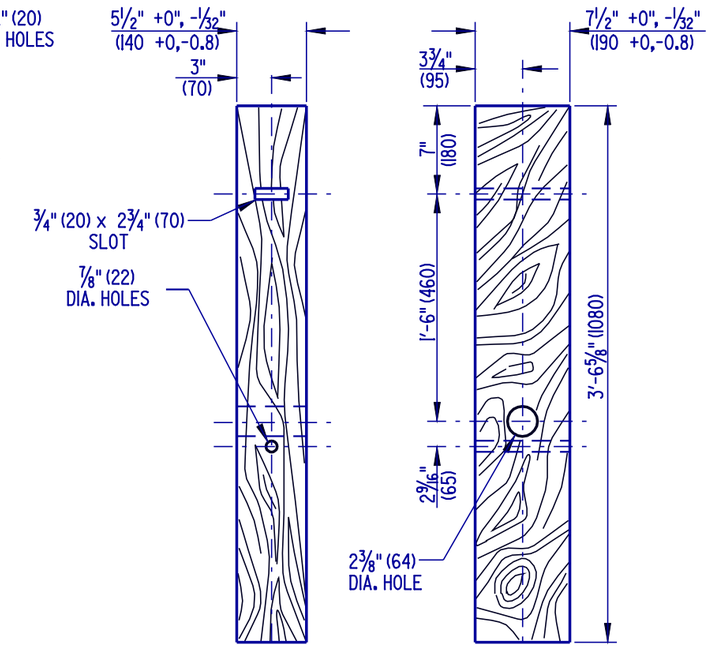

## SOIL PLATE



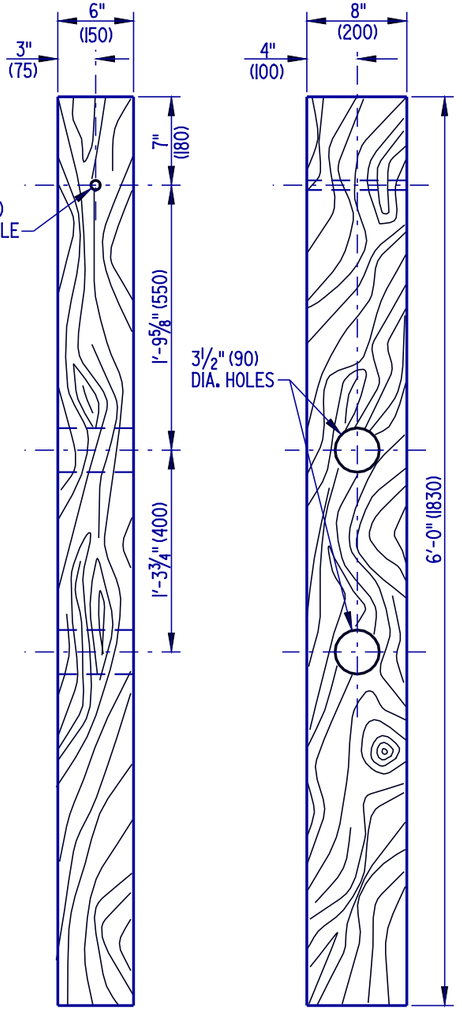

## STEEL TUBE




## WOOD BLOCK




## SHORT WOOD BREAKAWAY POST

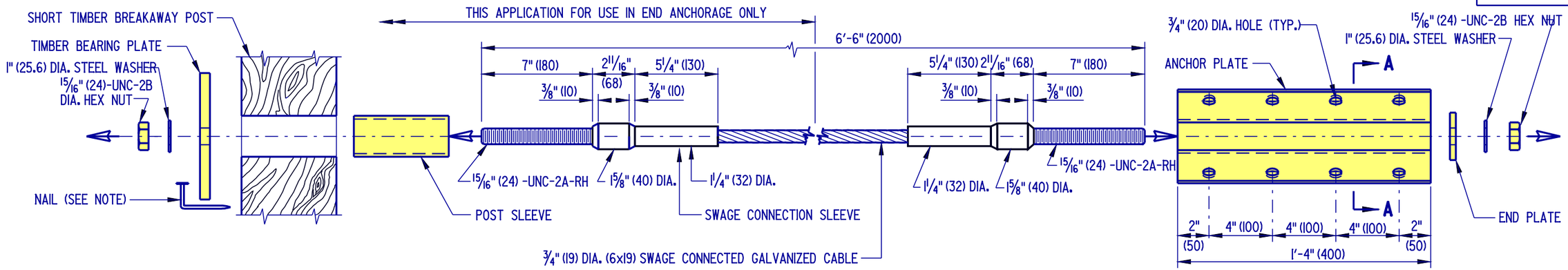



## LONG WOOD BREAKAWAY POST

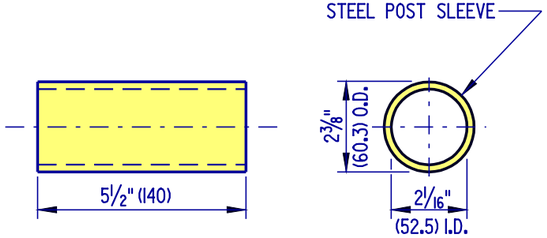
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. B-13 (2004) | SHT. 7 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/21/2004

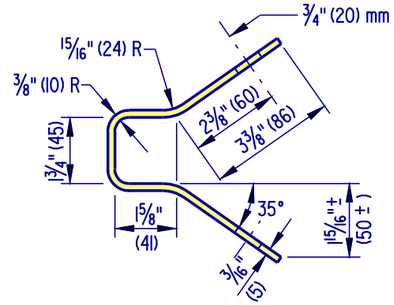
SCALE : N.T.S.



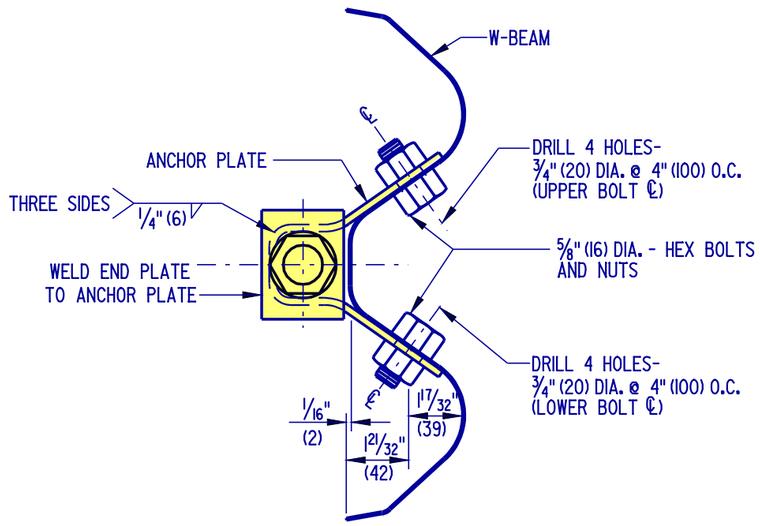

## SWAGED CABLE ASSEMBLAGE AND RELATED HARDWARE ASSEMBLY



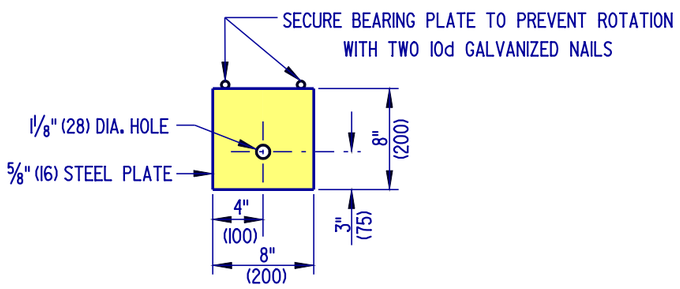

### POST SLEEVE



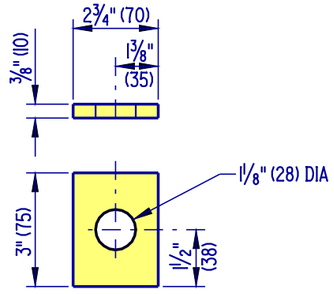

### SECTION A-A




### ANCHOR PLATE TO W-BEAM CONNECTION DETAIL




### TIMBER BEARING PLATE




### END PLATE

**NOTES:** 1). TO ENSURE THAT THE TIMBER BEARING PLATE REMAINS IN POSITION, 2 - 10d GALVANIZED STEEL NAILS SHALL BE DRIVEN IN THE SHORT TIMBER BREAKAWAY POST, AND BENT OVER BEARING PLATE.

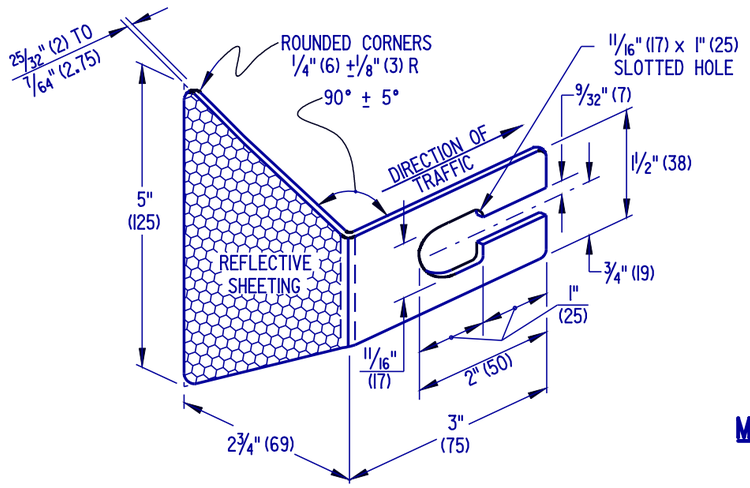
2). TIGHTEN ASSEMBLY UNTIL CABLE IS TAUGHT.

3). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

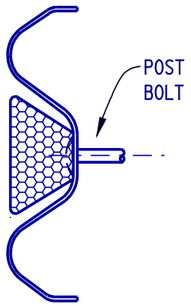
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|---|
| | STANDARD NO. B-13 (2004) | SHT. 8 | OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/21/2004

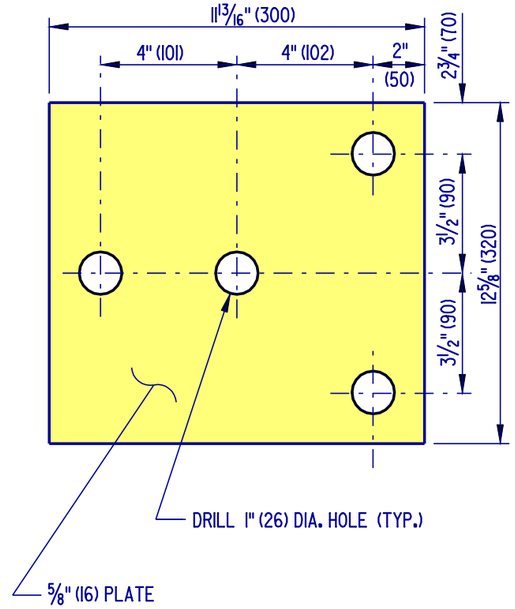
SCALE : N.T.S.




GUARDRAIL REFLECTOR




MOUNTING POSITION

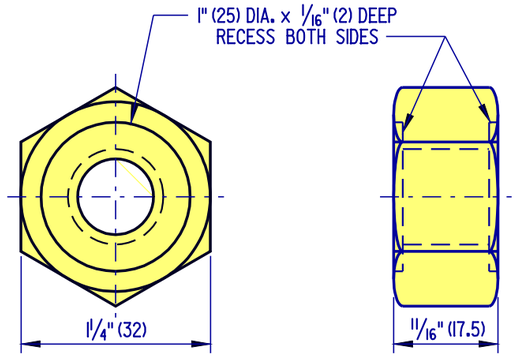



BEARING PLATE DETAIL (II)

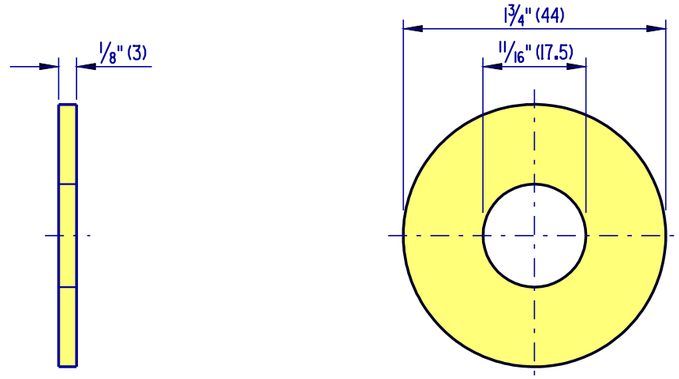
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. B-13 (2004) | SHT. 9 OF 13 | RECOMMENDED Dennis M. O'Shea DESIGN ENGINEER 1/3/05 DATE |

12/08/2004

SCALE : N.T.S.

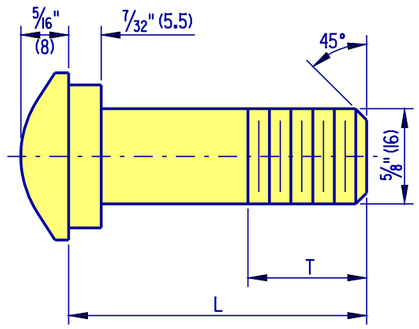


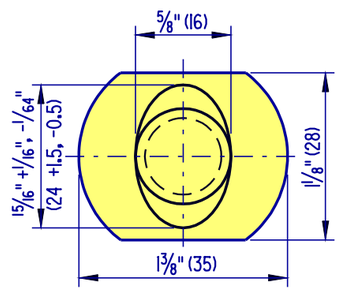

## RECESSED NUT (FOR 5/8" (16) GUARDRAIL BOLT)




## STEEL WASHER (FOR 5/8" (16) GUARDRAIL BOLT)

NOTE: DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASED ON METAL THICKNESS.




## GUARDRAIL BOLT

| L | T (MIN.) |
|---|---|
| 1 1/4" (35) | FULL THREAD LENGTH |
| 2" (50) | FULL THREAD LENGTH |
| 4" (100) | FULL THREAD LENGTH |
| 10" (255) | 4" (100) THREAD LENGTH |
| 18" (460) | 4" (100) THREAD LENGTH |

NOTES : 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/16" (2).
2. IF THE BOLT EXTENDS MORE THAN 1/2" (12) BEYOND THE NUT, THE BOLT SHALL BE TRIMMED BACK AS PER THE DEPARTMENT'S SPECIFICATIONS.

DELAWARE
DEPARTMENT OF TRANSPORTATION

HARDWARE

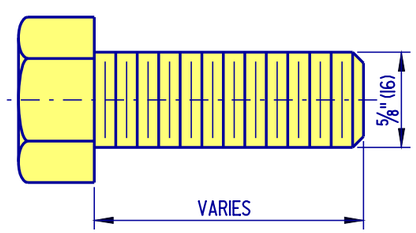
STANDARD NO. B-13 (2004) | SHT. 10 OF 13

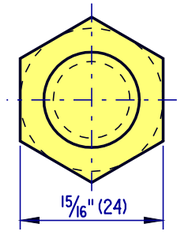
APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

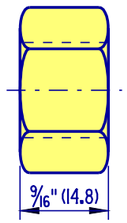
09/23/2004

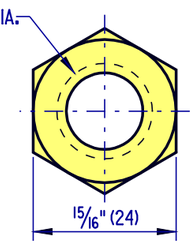
SCALE : N.T.S.



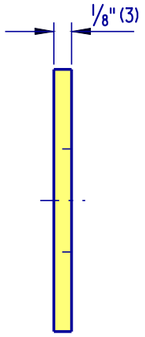



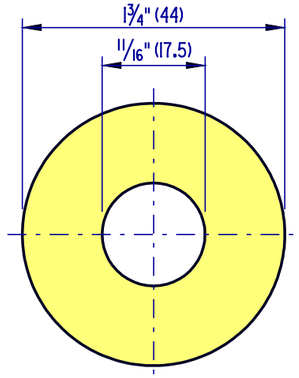

## 5/8" (16) HEX BOLT



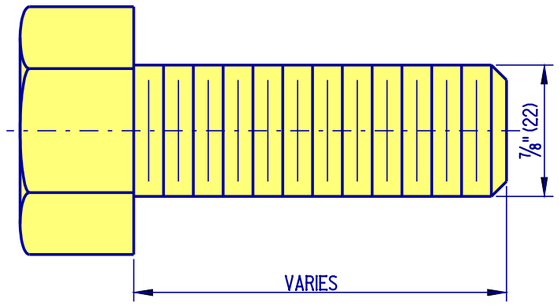

## 5/8" (16) HEX NUT

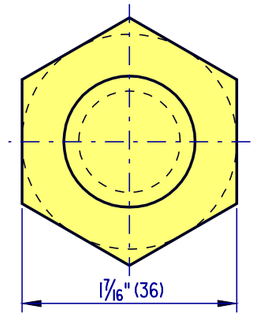


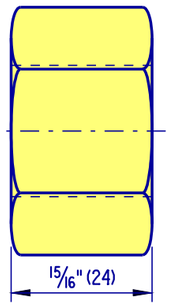

## 5/8" (16) STEEL WASHER

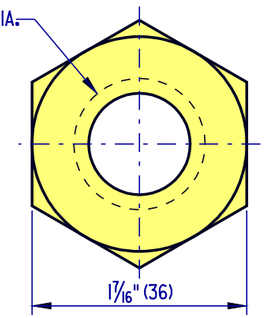
NOTE : DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASE METAL THICKNESS.




## HIGH-STRENGTH STRUCTURAL HEX BOLT



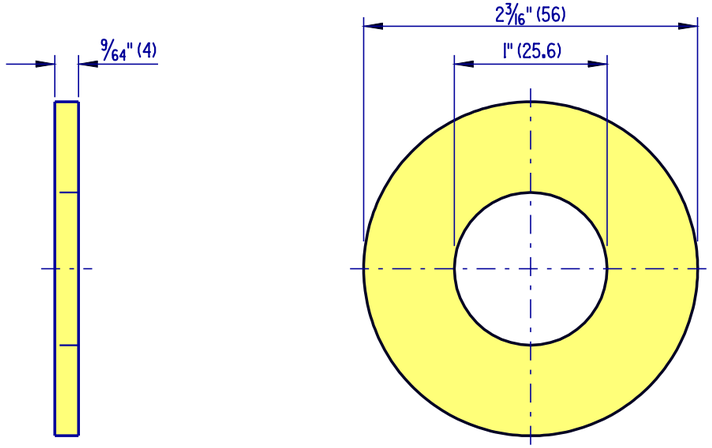




## HIGH-STRENGTH STRUCTURAL HEX NUT

| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. B-13 (2004) | SHT. 11 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

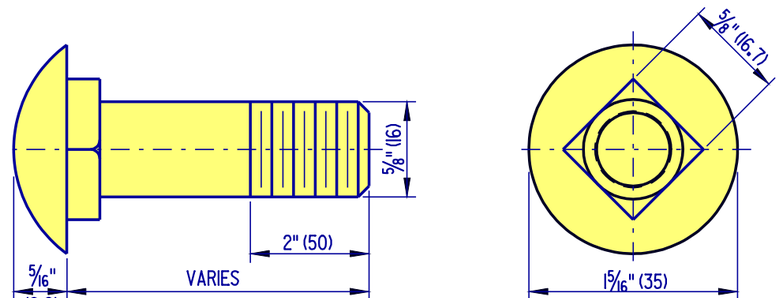
09/21/2004

SCALE : N.T.S.

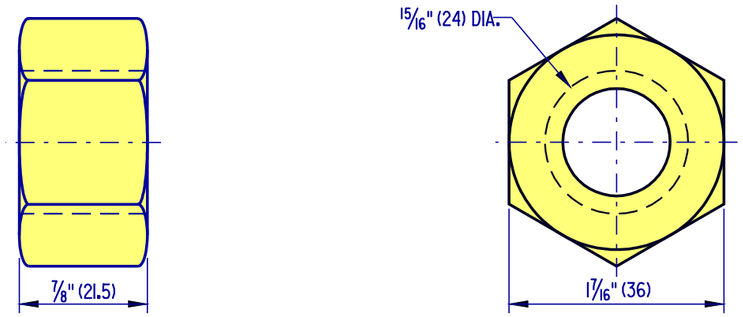



## STEEL WASHER

**NOTES :** 1. FOR USE WITH SWAGED CABLE ASSEMBLAGE.
2. DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASE METAL THICKNESS.




## 5/8" (16) CARRIAGE BOLT



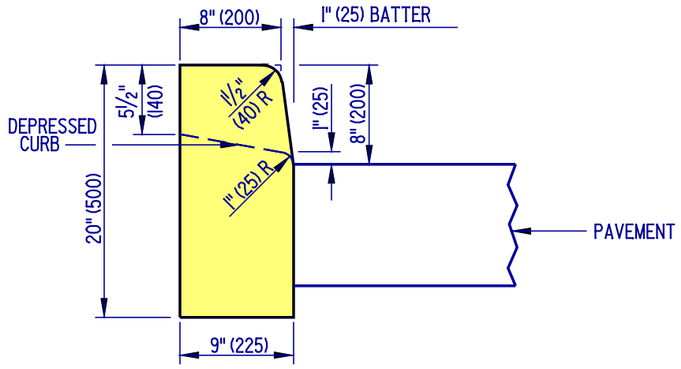

## 15/16" (24) HEX NUT

**NOTE :** FOR USE WITH SWAGED CABLE ASSEMBLAGE.

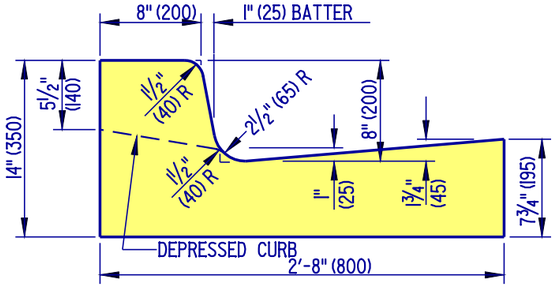
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | HARDWARE | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. B-13 (2004) | SHT. 12 OF 13 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/10/2004

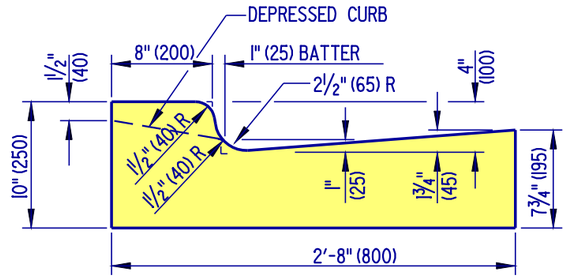
SCALE : N.T.S.



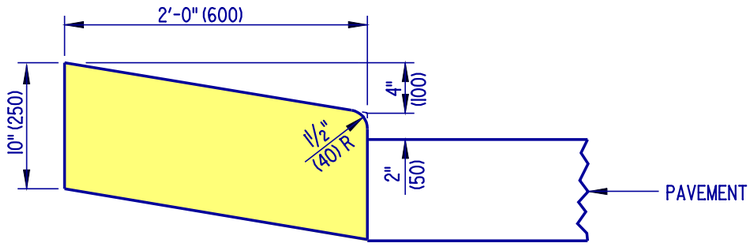

## P.C.C. CURB
TYPE 1



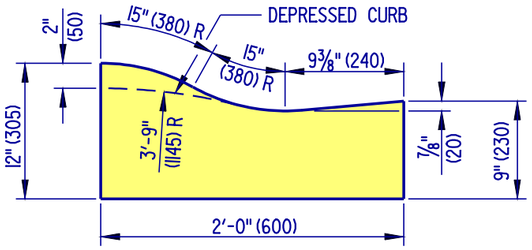

## INTEGRAL P.C.C. CURB AND GUTTER
TYPE 1



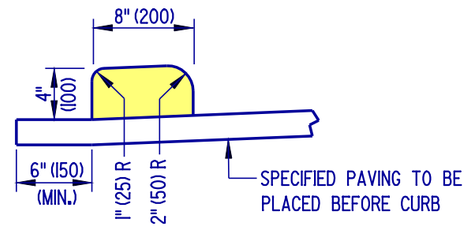

## INTEGRAL P.C.C. CURB AND GUTTER
TYPE 4



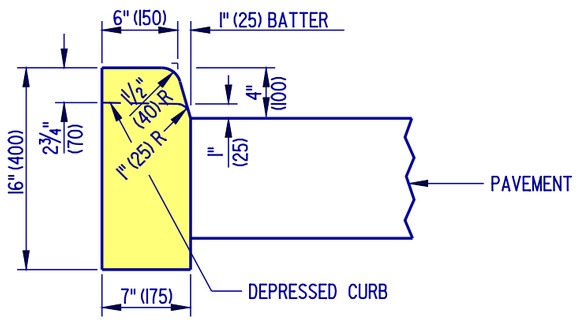

## P.C.C. CURB
TYPE 2



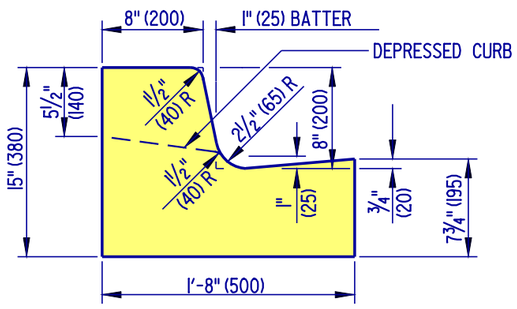

## INTEGRAL P.C.C. CURB AND GUTTER
TYPE 2




## HOT-MIX, HOT LAID BITUMINOUS CONCRETE CURB




## P.C.C. CURB
TYPE 3



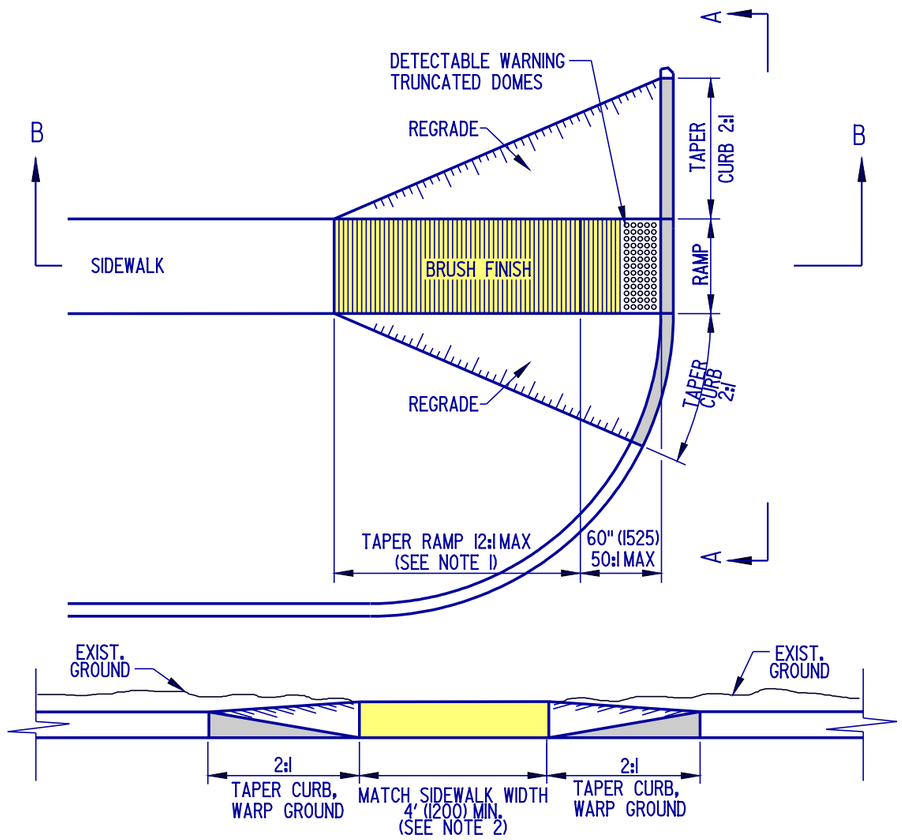

## INTEGRAL P.C.C. CURB AND GUTTER
TYPE 3

NOTES:
1. WHEN INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON STANDARD P-2, SHEET 3 OF 5. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2. DEPRESS CURB AT DRIVEWAYS AS DETAILED.
3. DEPRESS CURB FLUSH WITH PAVEMENT AT CURB RAMPS. MAXIMUM SLOPE OF DEPRESSED CURB IS 12:1.

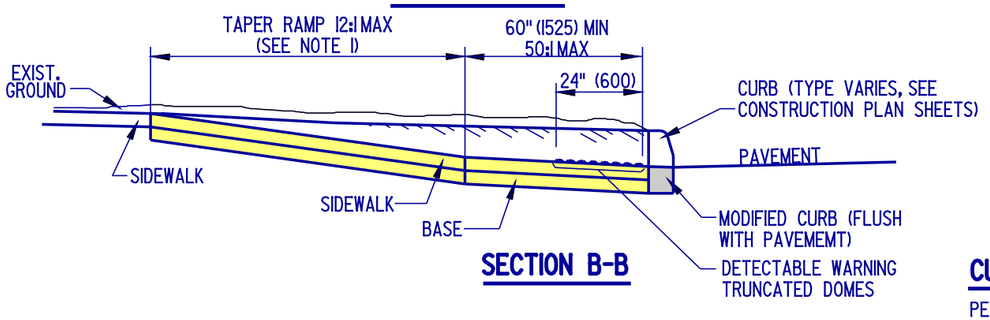
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | P.C.C. CURB, P.C.C. CURB & GUTTER, AND HOT-MIX CURB | APPROVED Carolann Wicks (CHIEF ENGINEER) 1/10/05 (DATE) |
| | STANDARD NO. C-1 (2004) SHT. 1 OF 1 | RECOMMENDED Dennis M. Office (DESIGN ENGINEER) 1/3/05 (DATE) |

09/27/2004

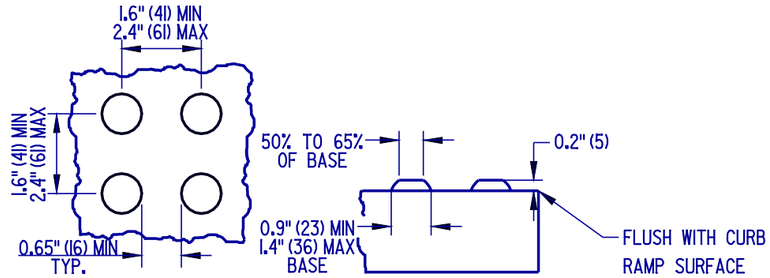
SCALE : N.T.S.




## ELEVATION A-A

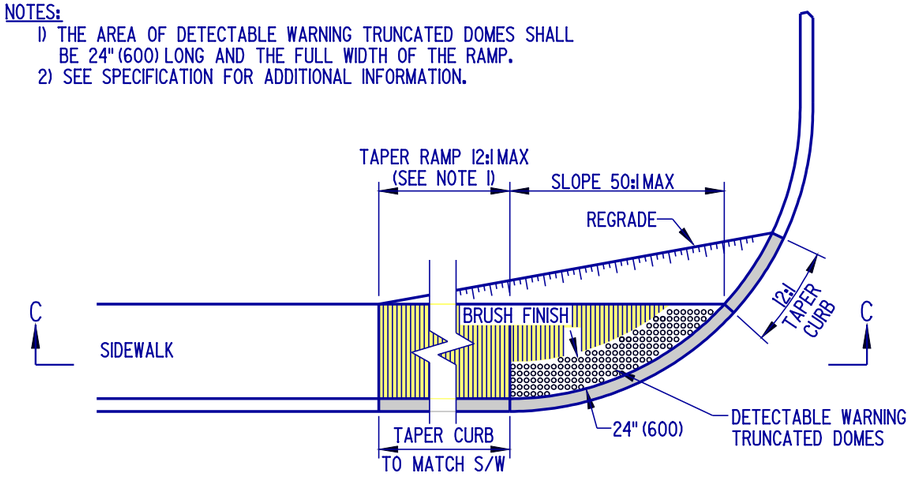


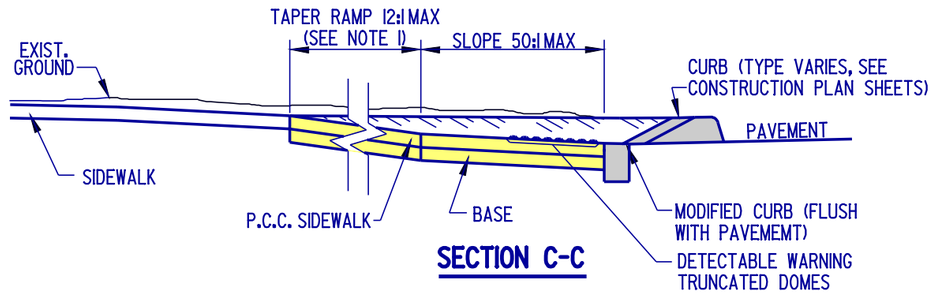

## SECTION B-B




## DETECTABLE WARNING TRUNCATED DOME DETAILS

NOTES:
1) THE AREA OF DETECTABLE WARNING TRUNCATED DOMES SHALL BE 24" (600) LONG AND THE FULL WIDTH OF THE RAMP.
2) SEE SPECIFICATION FOR ADDITIONAL INFORMATION.




## SECTION C-C

**NOTES:** 1). WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.

2). RAMP WIDTH SHALL BE 4' (1200) MINIMUM, HOWEVER, 5' (1525) IS PREFERRED.

## CURB RAMP, TYPE 1

PERPENDICULAR CURB RAMP

DELAWARE
DEPARTMENT OF TRANSPORTATION

CURB RAMP, TYPE 1 AND SECTIONS

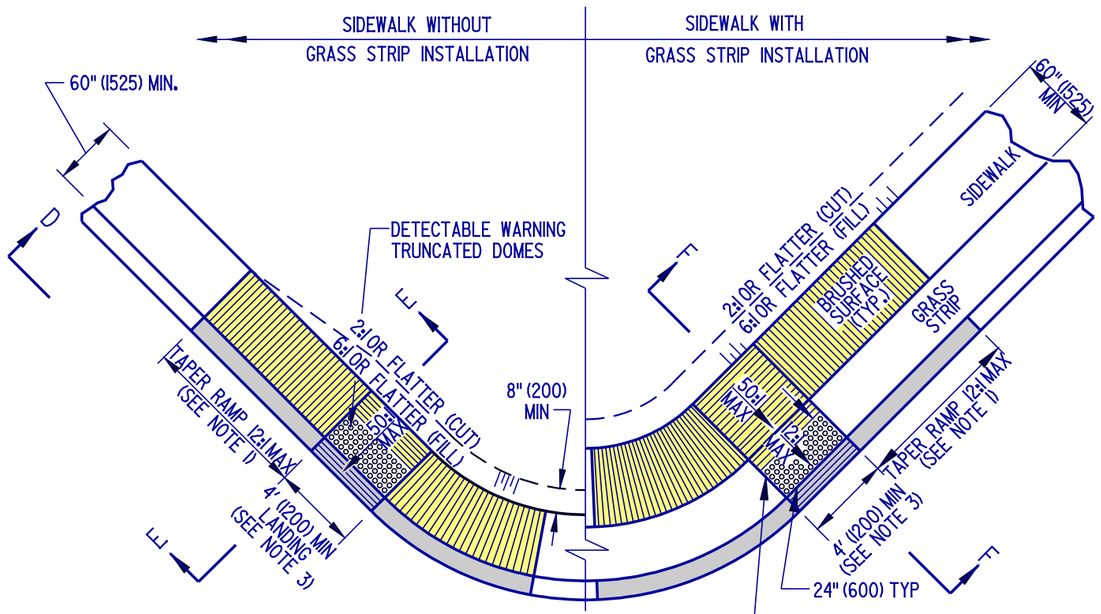
STANDARD NO. C-2 (2004) | SHT. 1 OF 4

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

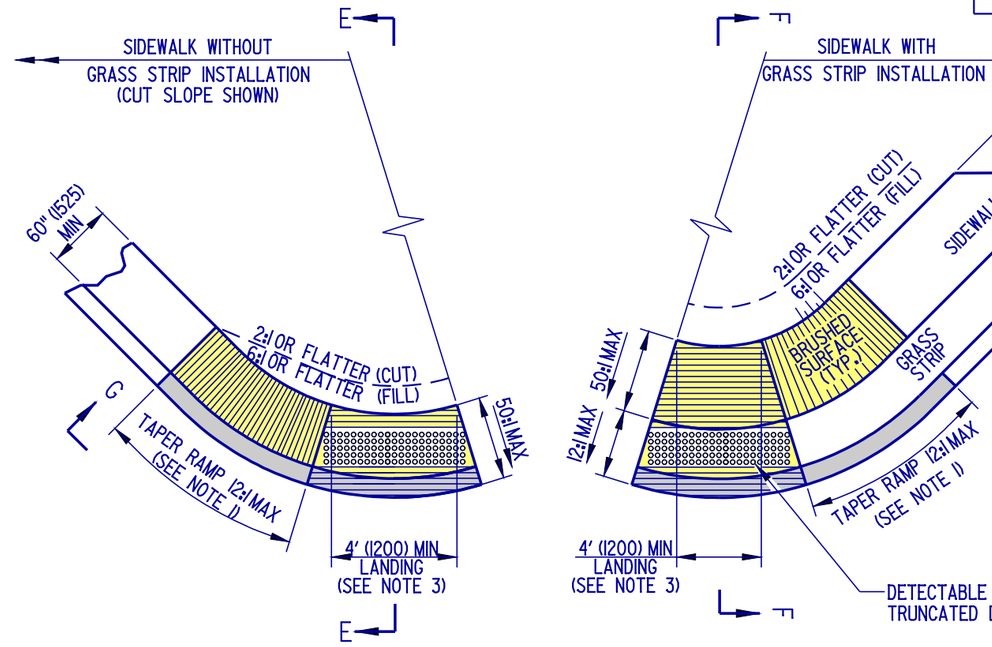
12/08/2004

SCALE : N.T.S.




## CURB RAMP, TYPE 2

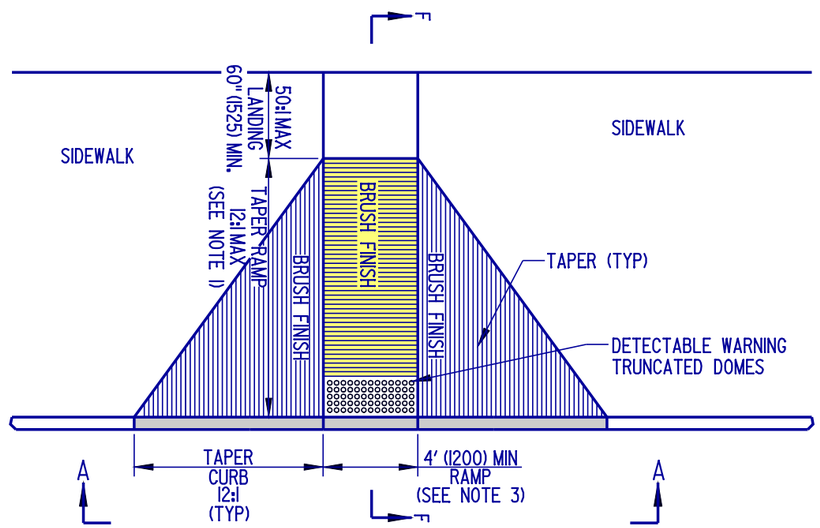
PARALLEL CURB RAMP




## CURB RAMP, TYPE 3

DIAGONAL CURB RAMP

NOTE: THE DIAGONAL CURB RAMP IS
NOT THE PREFERRED TREATMENT.




## CURB RAMP, TYPE 4

PERPENDICULAR CURB RAMP

**NOTES:** 1). WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.

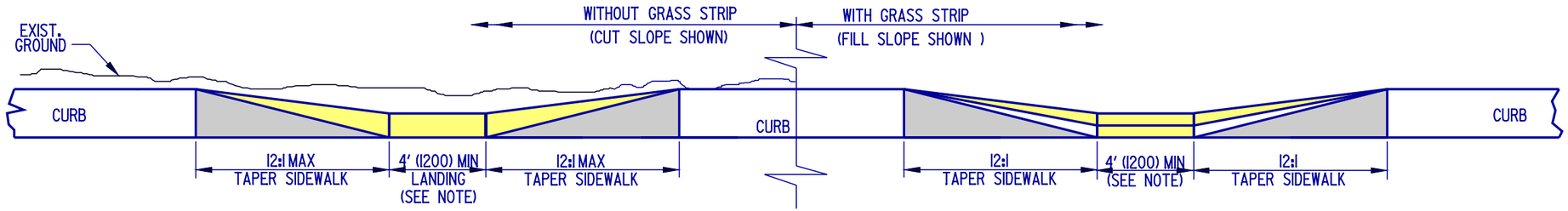
2). TRANSITION TO EXISTING SIDEWALK WIDTH OVER THE LENGTH OF THE RAMP.

3). RAMP WIDTH SHALL BE 4' (1200) MINIMUM, HOWEVER, 5' (1525) IS PREFERRED.

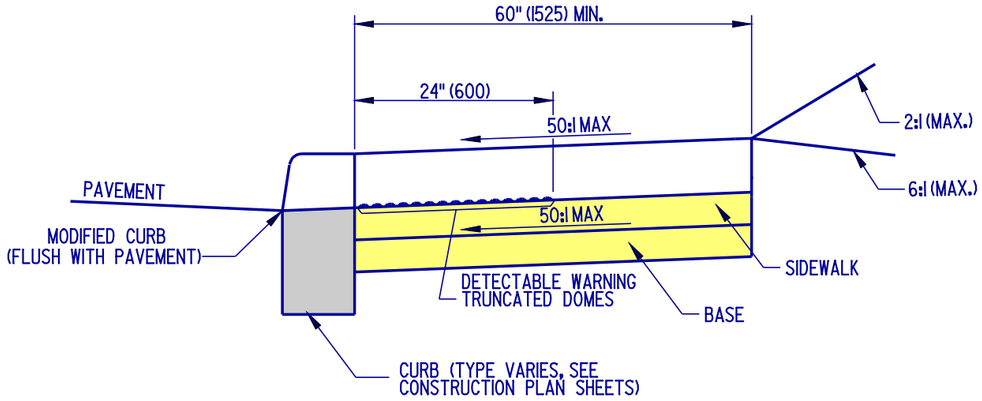
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | CURB RAMPS, TYPES 2, 3, & 4 | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. C-2 (2004) SHT. 2 OF 4 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

12/22/2004

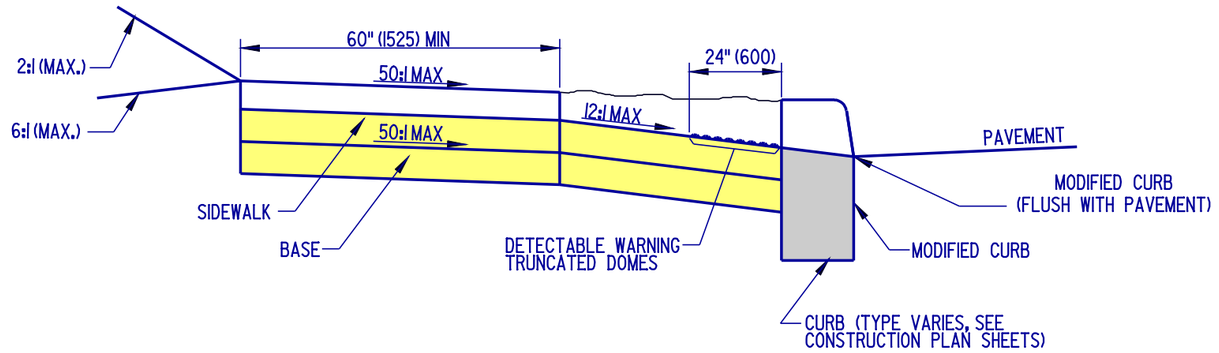
SCALE : N.T.S.



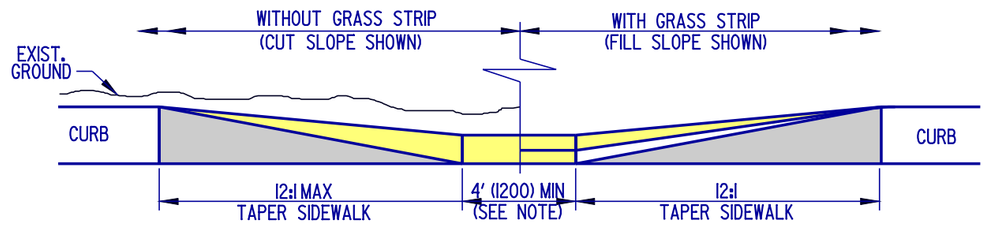

## ELEVATION D-D




## SECTION E-E




## SECTION F-F



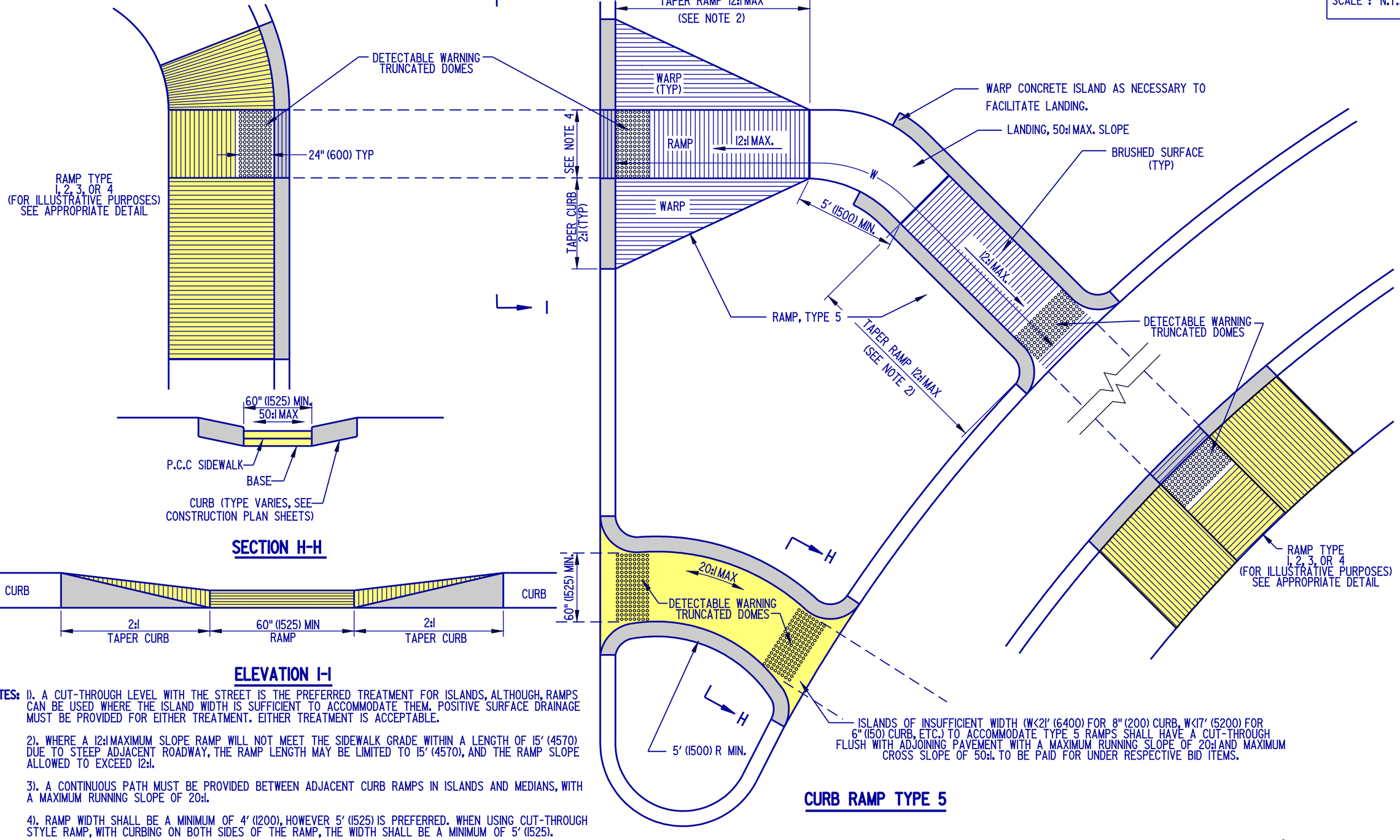

## ELEVATION G-G

**NOTE:** CURB RAMP WIDTH SHALL BE 4' (1200) MINIMUM, HOWEVER, 5' (1525) IS PREFERRED.

| | | |
|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | CURB RAMP SECTIONS FOR TYPES 2 & 3 | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. C-2 (2004) SHT. 3 OF 4 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

12/08/2004

SCALE : N.T.S.




## ELEVATION I-I

## CURB RAMP TYPE 5

**NOTES:** 1). A CUT-THROUGH LEVEL WITH THE STREET IS THE PREFERRED TREATMENT FOR ISLANDS, ALTHOUGH, RAMPS CAN BE USED WHERE THE ISLAND WIDTH IS SUFFICIENT TO ACCOMMODATE THEM. POSITIVE SURFACE DRAINAGE MUST BE PROVIDED FOR EITHER TREATMENT. EITHER TREATMENT IS ACCEPTABLE.

2). WHERE A 12:1 MAXIMUM SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 15' (4570) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 15' (4570), AND THE RAMP SLOPE ALLOWED TO EXCEED 12:1.

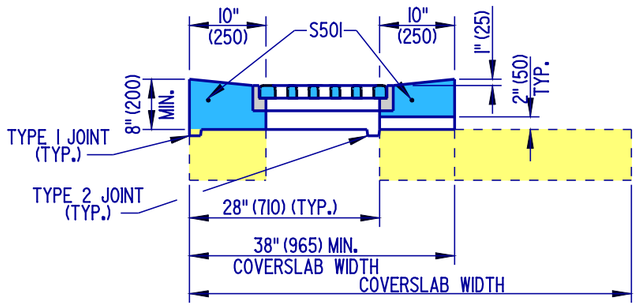
3). A CONTINUOUS PATH MUST BE PROVIDED BETWEEN ADJACENT CURB RAMPS IN ISLANDS AND MEDIANS, WITH A MAXIMUM RUNNING SLOPE OF 20:1.

4). RAMP WIDTH SHALL BE A MINIMUM OF 4' (1200), HOWEVER 5' (1525) IS PREFERRED. WHEN USING CUT-THROUGH STYLE RAMP, WITH CURBING ON BOTH SIDES OF THE RAMP, THE WIDTH SHALL BE A MINIMUM OF 5' (1525).

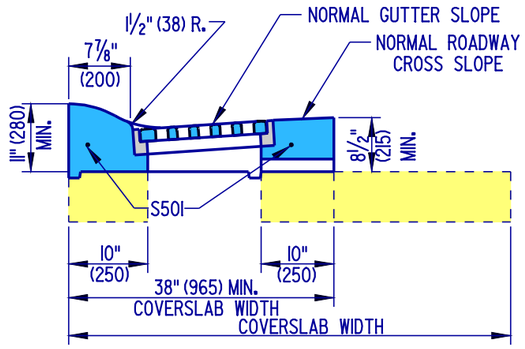
| | | |
|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | CURB RAMP TYPE 5 & SECTIONS | APPROVED Carolann Wicks 1/10/05<br>CHIEF ENGINEER DATE |
| | STANDARD NO. C-2 (2004) SHT. 4 OF 4 | RECOMMENDED Dennis M. O'Toole 1/3/05<br>DESIGN ENGINEER DATE |

12/08/2004

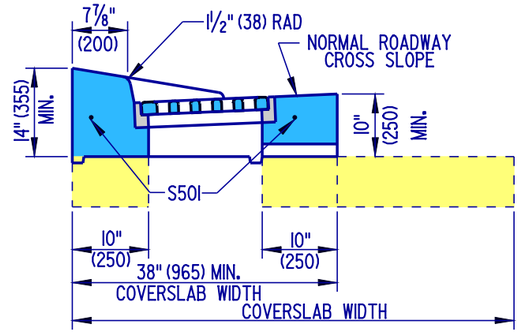
SCALE : N.T.S.



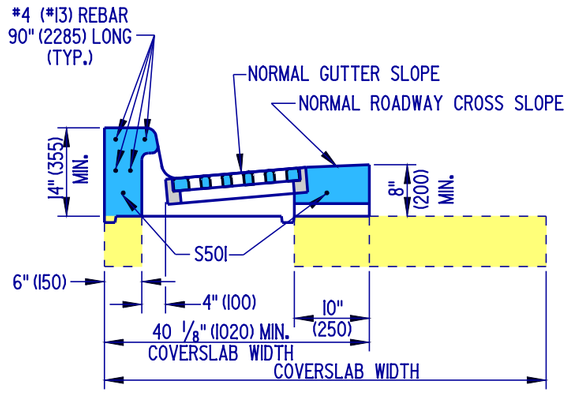

## TYPE A



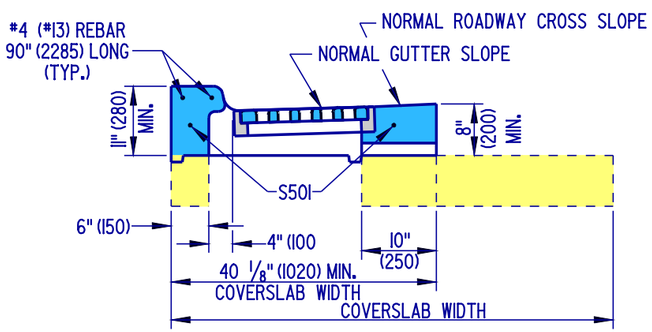

## TYPE D




## TYPE E



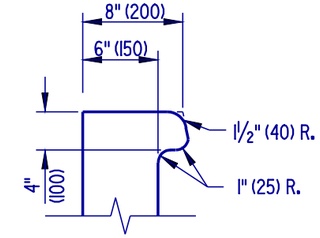

## TYPE B



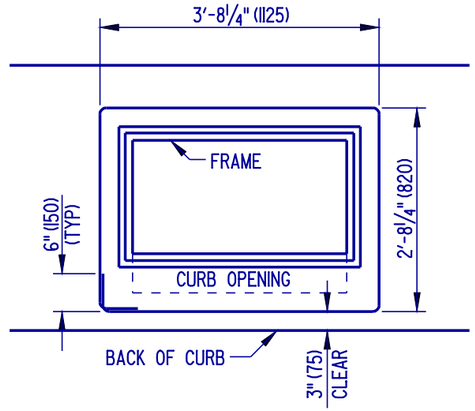

## TYPE C

### INLET TOP UNIT APPLICATIONS

| TOP UNIT | CURB |
|---|---|
| TYPE A | USE IN DRAINAGE SWALE |
| TYPE B | INTEGRAL PCC CURB & GUTTER, TYPE 1 & 3, PCC CURB TYPE 1 |
| TYPE C | INTEGRAL PCC CURB & GUTTER, TYPE 4, PCC CURB TYPE 3 |
| TYPE D | INTEGRAL PCC CURB & GUTTER, TYPE 2 |
| TYPE E | PCC CURB TYPE 2 |




## CURB OPENING DETAIL

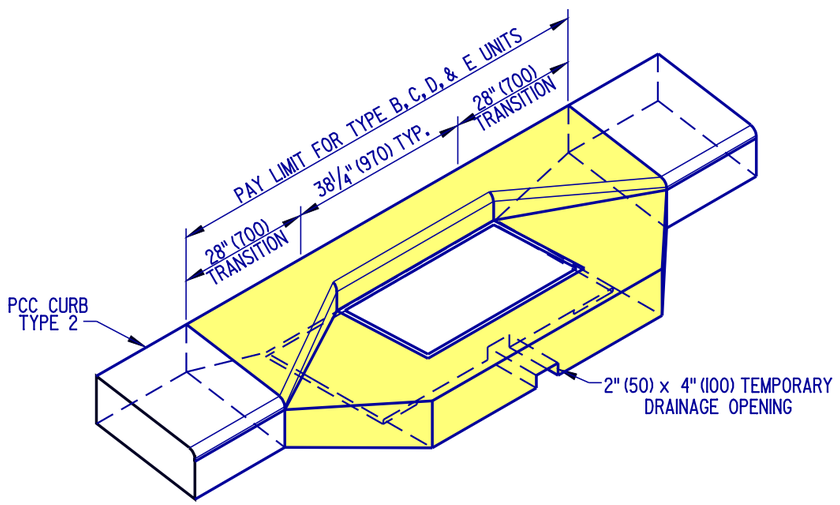



## S501 BENDING DIAGRAM

S501 IS NOT REQUIRED TO BE ONE CONTINUOUS BAR. IF MORE THAN ONE BAR IS USED, THERE MUST BE A 12" (300) OVERLAP BETWEEN BARS.

## DRAINAGE INLET TOP UNITS

NOTE: TOP UNIT IS TO BE CAST-IN-PLACE TO GRADE AS SPECIFIED ON PLAN SHEETS OR AS DIRECTED BY ENGINEER.




## ISOMETRIC VIEW

TYPE E UNIT SHOWN

DELAWARE
DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET DETAILS

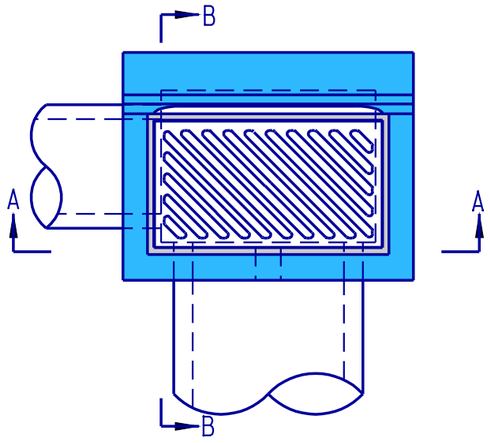
STANDARD NO. D-5 (2004) | SHT. 3 OF 8

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

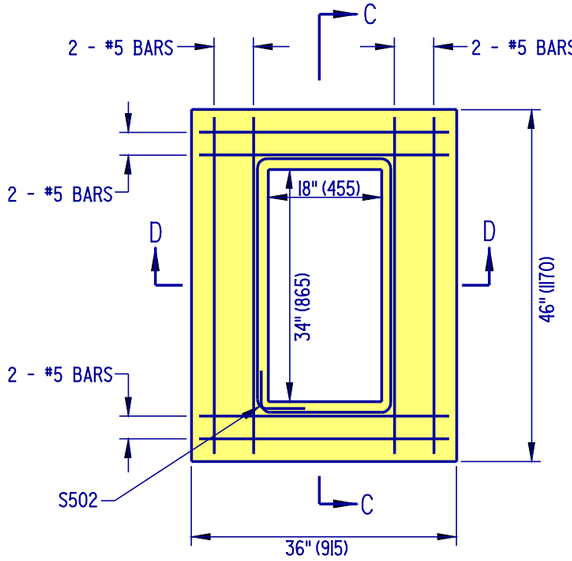
RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/27/2004

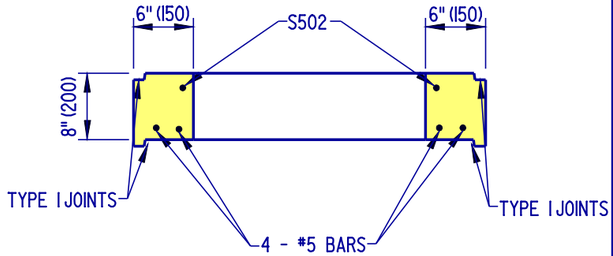
SCALE : N.T.S.



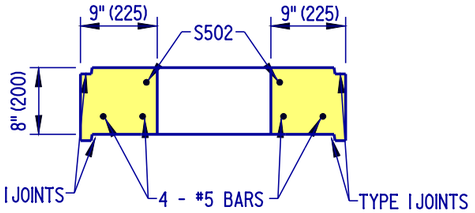

TOP VIEW




PLAN

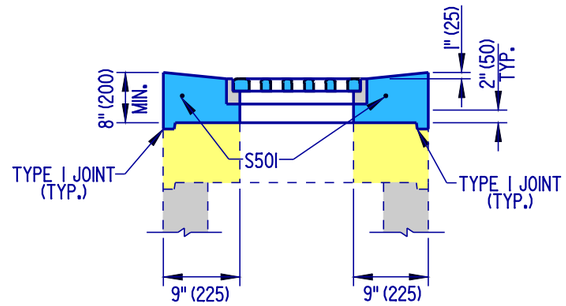



SECTION C-C

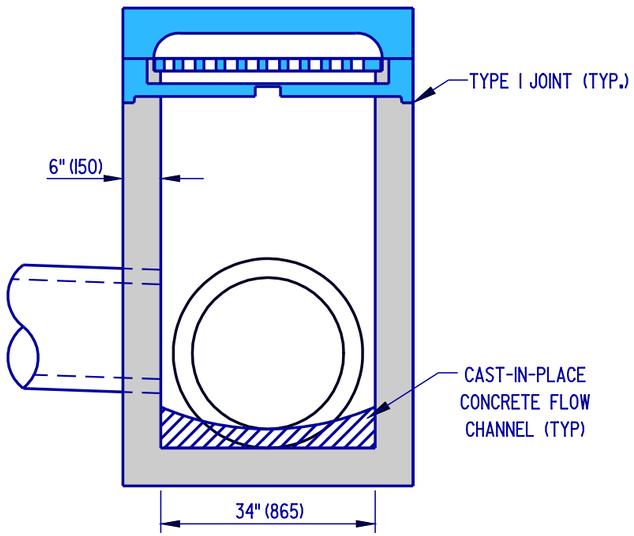



SECTION D-D

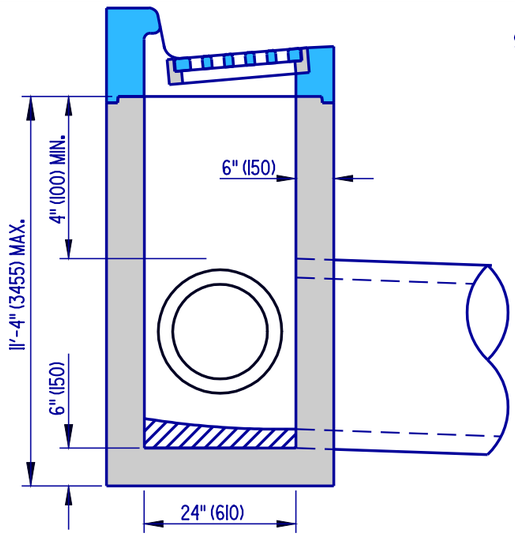
COVER SLAB DETAILS




TYPE A



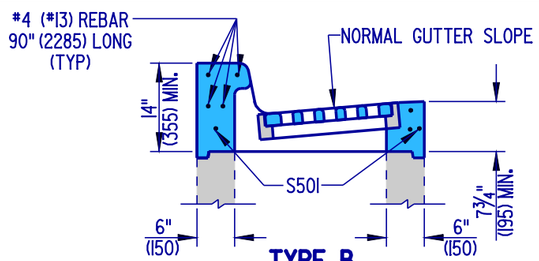

SECTION A-A



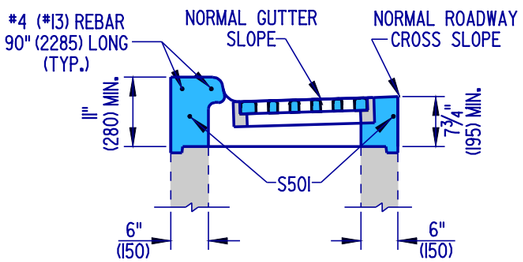

SECTION B-B

34" (865) x 24" (610) DRAINAGE INLET DETAILS

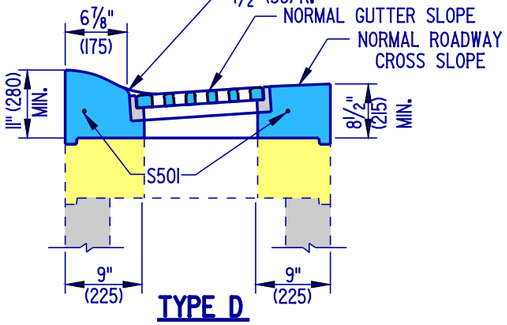
NOTE: REFER TO PREVIOUS SHEETS FOR REINFORCING REQUIREMENTS



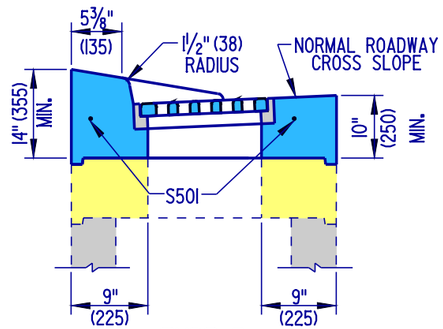

TYPE B




TYPE C




TYPE D



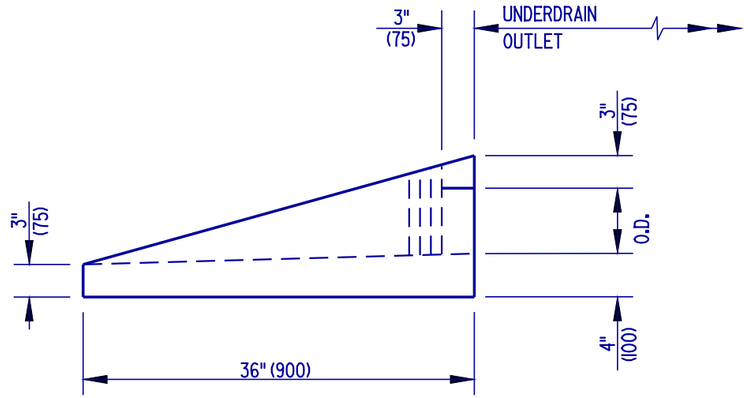

TYPE E

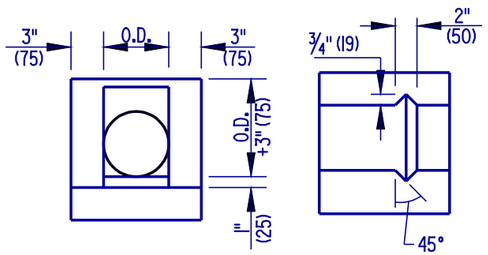
TOP UNIT DETAILS

| DELAWARE DEPARTMENT OF TRANSPORTATION | DRAINAGE INLET DETAILS | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. D-5 (2004) | SHT. 6 OF 8 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 11/3/05 DATE |

09/27/2004

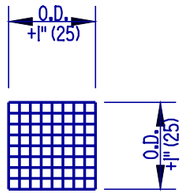
SCALE : N.T.S.




FRONT VIEW TOP VIEW

SLOTTED HEADWALL DETAIL

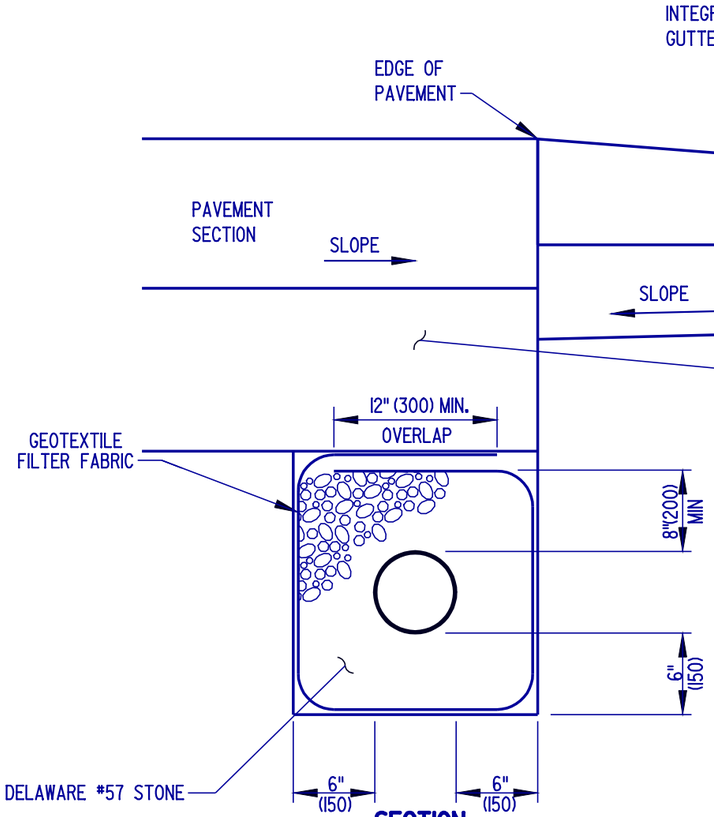



FRONT VIEW

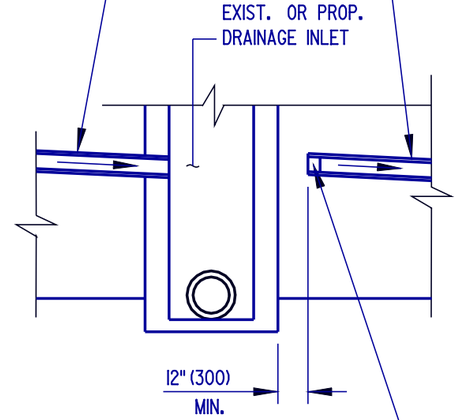
RODENT SCREEN

## CONCRETE HEADWALL FOR UNDERDRAIN OUTLET

NOT TO SCALE




SECTION




ELEVATION

## PERFORATED PIPE UNDERDRAIN

NOT TO SCALE

NOTES:

1. GEOTEXTILE FILTER FABRIC SHALL BE PLACED ENTIRELY OVER THE TOP OF UNDERDRAIN TRENCH AND LAPPED AS SHOWN.
2. SLOPE OF UNDERDRAINS SHALL MATCH ROADWAY GRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. OUTLET PIPE CONFIGURATIONS SHALL USE 45 DEGREE ELBOWS OR SHALL USE STRAIGHT PIPE WITH A MINIMUM RADIUS OF 3' (900) TO DIRECT UNDERDRAIN PIPE INTO SIDE OF DRAINAGE INLET OR TO POSITIVE GRADE. PIPE SHALL ALSO BE NON-PERFORATED AND HAVE A SMOOTH INTERIOR.
4. RODENT SCREEN SHALL SNUGLY FIT THE PROVIDED SLOT WITH THE SCREEN LIP FITTING TIGHT TO THE BOTTOM FLOW LINE.
5. A 4' (1200) FLEXIBLE DELINEATOR SHALL BE FURNISHED AND INSTALLED AT THE DIRECTION OF THE ENGINEER TO MARK THE LOCATION OF THE CONCRETE HEADWALL. COST INCIDENTAL TO DOWNSPOUT SPLASH APRONS ITEM.
6. WHEN TWO LINES OF PIPE UNDERDRAIN DRAIN TO A LOW POINT, EACH PIPE MUST HAVE ITS OWN OUTLET.

DELAWARE
DEPARTMENT OF TRANSPORTATION

PERFORATED PIPE UNDERDRAIN DETAIL

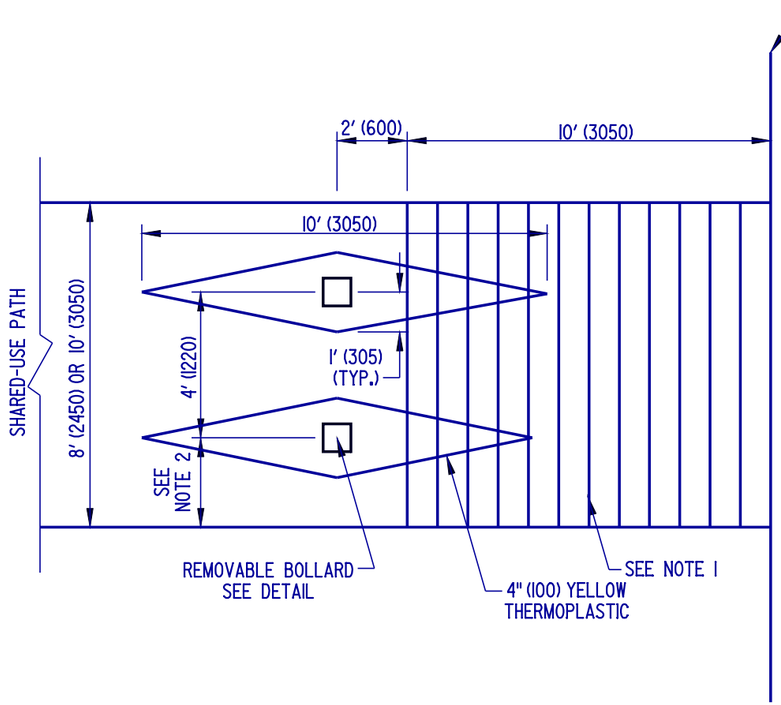
STANDARD NO. D-9 (2004) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

09/28/2004

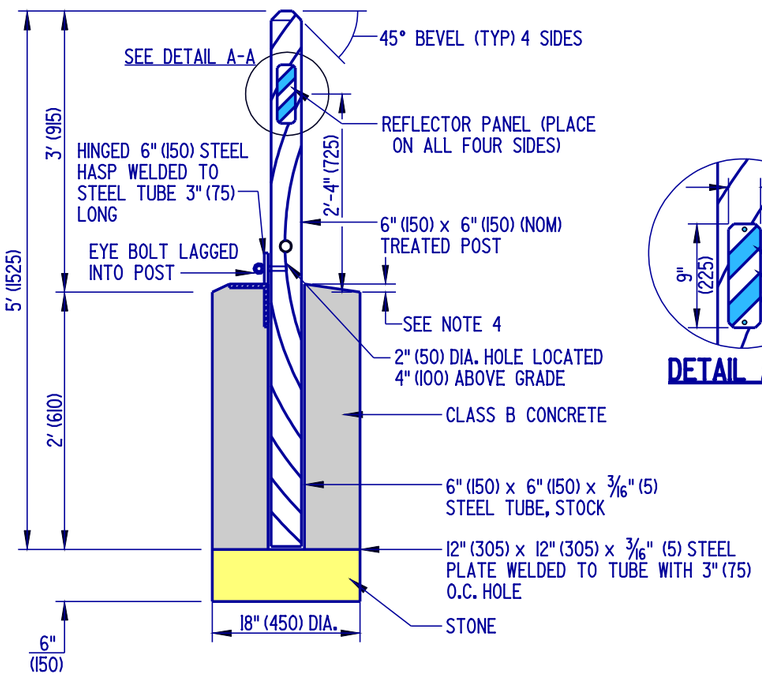
SCALE : N.T.S.



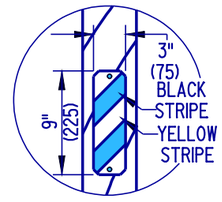

## SHARED USE PATH INTERSECTION

NOTES:

1. THE 4" (100) CONCRETE SHARED-USE PATH SHALL BE FINISHED TO INCLUDE A TEXTURED WARNING SURFACE BY USING A JOINT STRIKE TO PRODUCE A ½" (12) DEEP V-JOINT AT 6" (150) O.C. PAYMENT FOR INSTALLING THE GROOVED FINISH SHALL BE INCIDENTAL TO THE SIDEWALK CONSTRUCTION.
2. FOR 8' (2450) AND 10' (3050) PATH WIDTH, THE OUTSIDE DIMENSION FROM CENTER OF BOLLARD TO EDGE OF PATH SHALL BE 2' (610) AND 3' (915) RESPECTIVELY.
3. IF THE SHARED USE PATH ENDS AT A ROADWAY, THEN DETECTABLE WARNING TRUNCATED DOMES 24" (600) LONG AND THE FULL WIDTH OF THE PATH SHALL BE INSTALLED. SEE SHEET C-2.
4. STEEL TUBE TO EXTEND ½" (13) ABOVE GROUND WITH CONCRETE TO SLOPE AWAY FROM TUBE TO KEEP WATER AND SEDIMENT FROM DRAINING INTO TUBE.




## REMOVABLE BOLLARD




## DETAIL A-A

DELAWARE
DEPARTMENT OF TRANSPORTATION

BOLLARD DETAILS

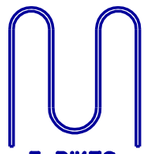
STANDARD NO. M-3 (2004) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/27/2004

SCALE : N.T.S.

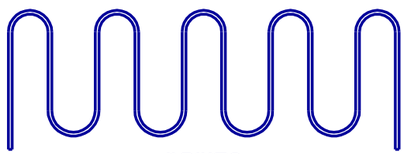


**5 BIKES**
W = 38" (965)

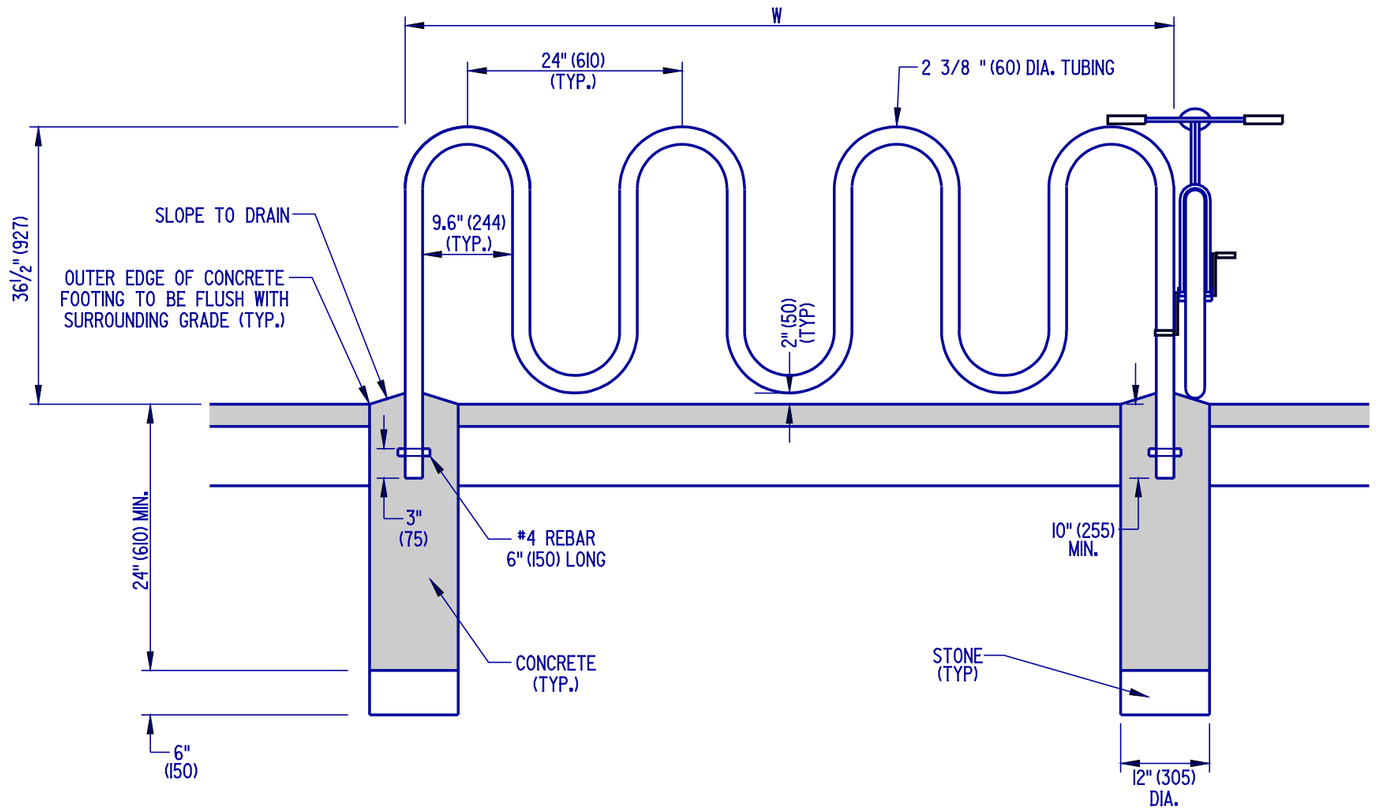
**7 BIKES**
W = 63" (1600)



**9 BIKES**
W = 87" (2210)



**11 BIKES**
W = 111" (2819)




**BICYCLE RACK**
N.T.S.

DELAWARE
DEPARTMENT OF TRANSPORTATION

BIKE RACK DETAILS

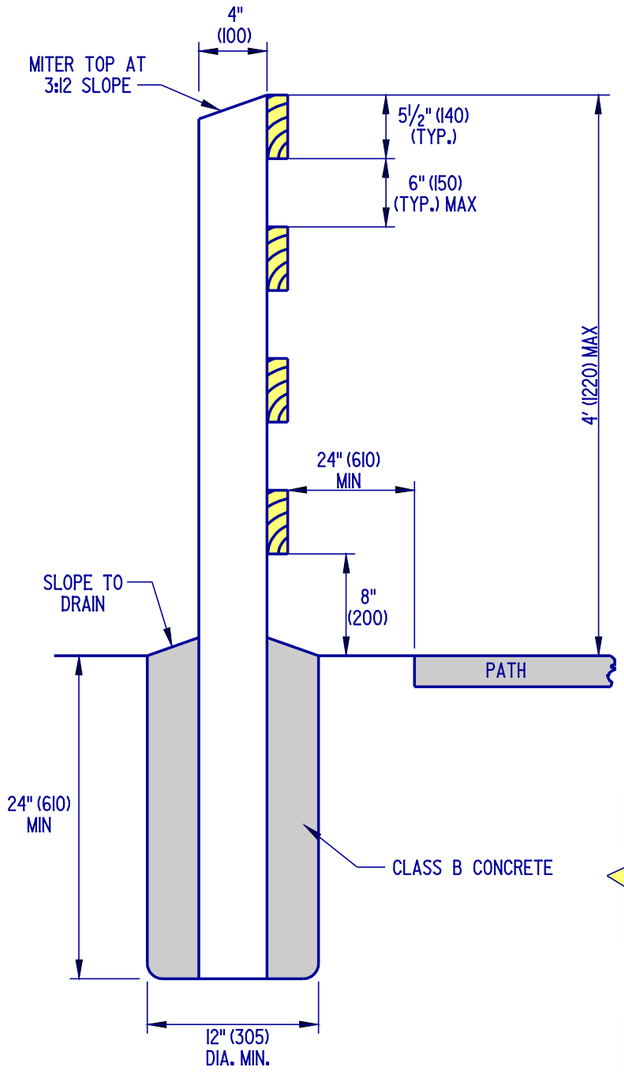
STANDARD NO. M-4 (2004) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

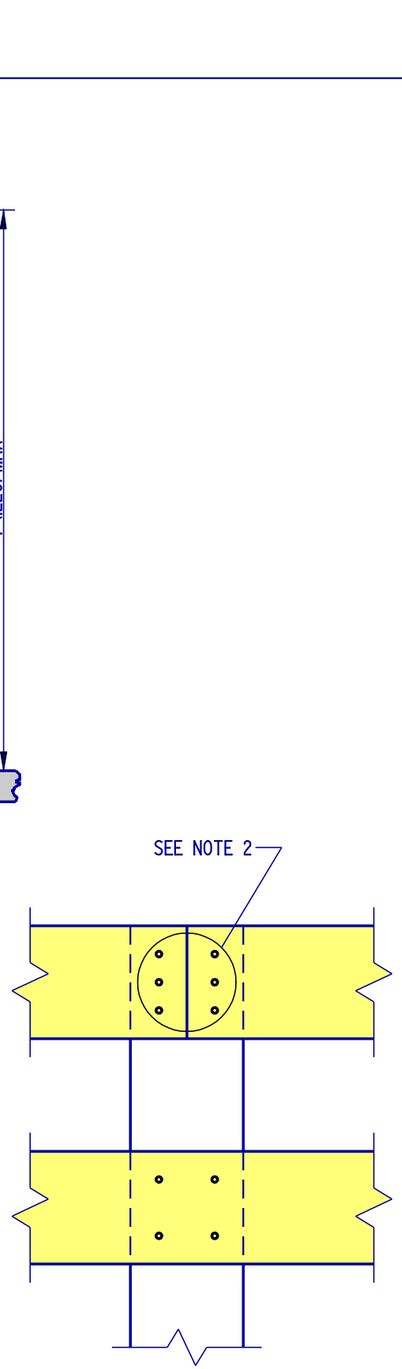
RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

09/27/2004

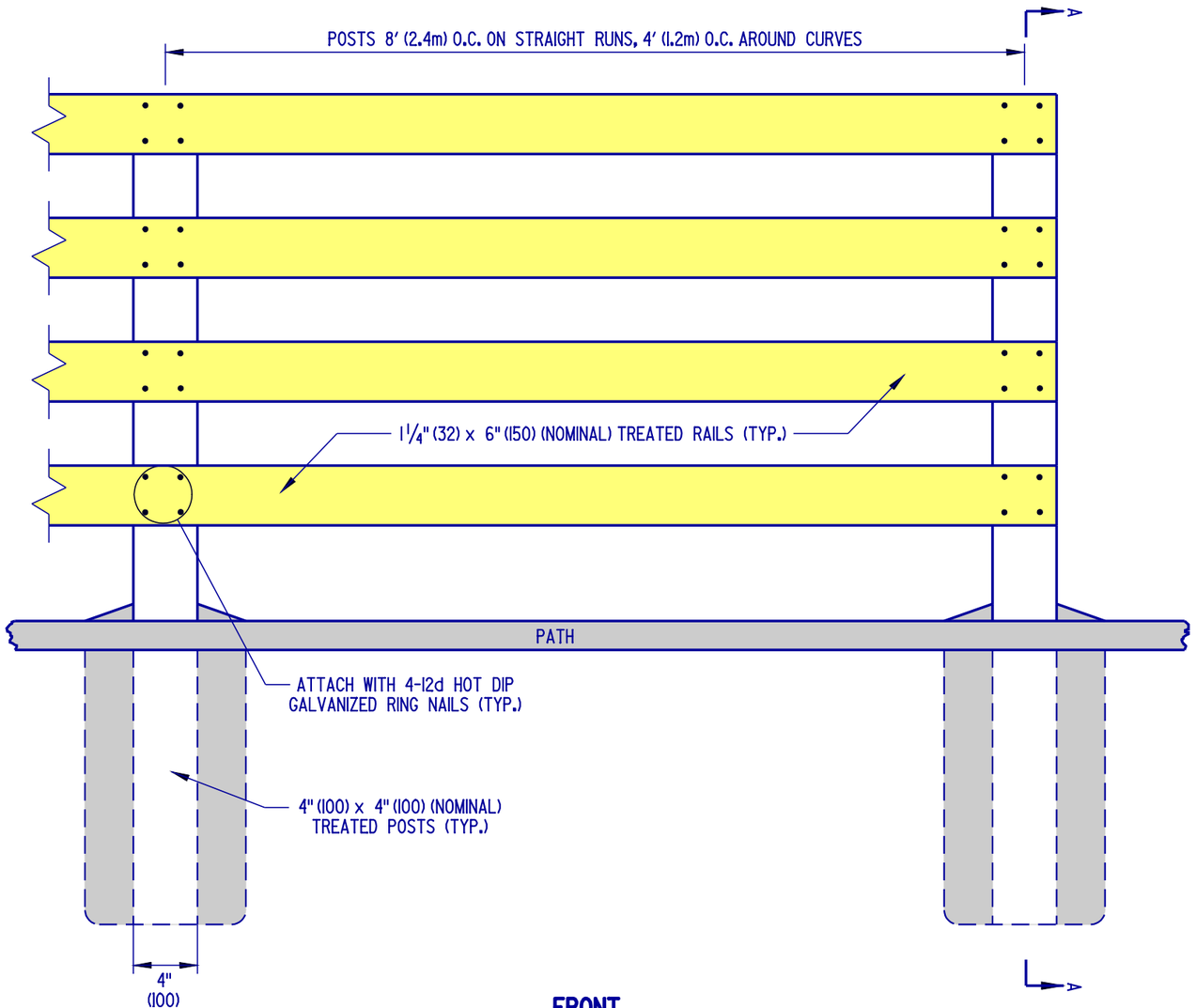
SCALE : N.T.S.




SECTION A-A




TYPICAL JOINT DETAIL



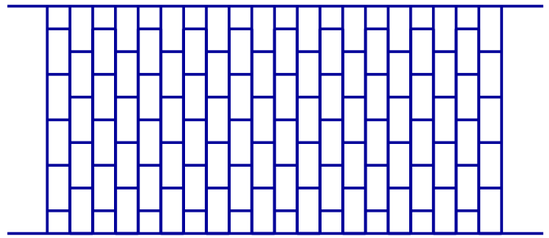

FRONT

NOTES:
1. ALL RAIL JOINTS SHALL BE CENTERED AT THE POSTS.
2. ALL JOINTS SHALL BE ATTACHED WITH 3 - 12d NAILS AND TWO ADJACENT RAILS SHALL NOT END ON THE SAME POST.
3. RAILS SHALL BE FLUSH TO THE POSTS AT THE END POSTS.

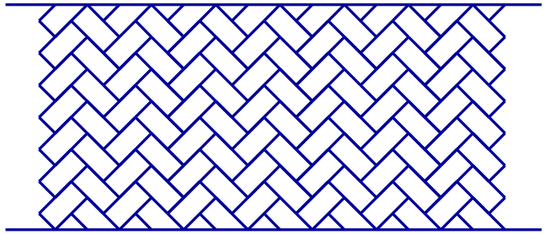
| DELAWARE DEPARTMENT OF TRANSPORTATION | WOOD RAIL FENCE DETAILS | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. M-5 (2004) | SHT. 1 OF 1 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/27/2004

SCALE : N.T.S.



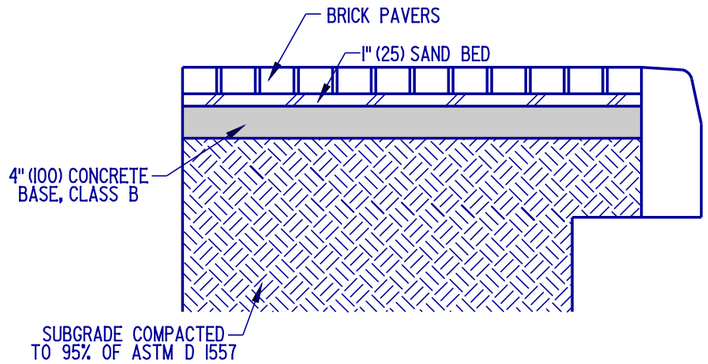
4" (100) x 8" (200) RUNNING BOND PATTERN



4" (100) x 8" (200) HERRINGBONE PATTERN

NOTES:

1. ACTUAL PATTERN TO BE USED SHALL BE SPECIFIED ON THE PLANS. COLOR IS TO BE "BRICK RED" UNLESS OTHERWISE NOTED ON THE PLANS.
2. MATERIALS AND PAVEMENT BOX VARY DEPENDING ON PLANS.
3. FOR CROSSWALK APPLICATIONS, 8" (200) WHITE LINES SHOULD BE PLACED ON BOTH SIDES.
4. THE PATTERNS ABOVE ARE THE PREFERRED PATTERNS AVAILABLE FOR SIDEWALK OR CROSSWALK APPLCATIONS.




BRICK PAVER SIDEWALK DETAIL

NOTES:

1. ALL PAVERS ARE TO BE "BRICK RED" UNLESS OTHERWISE SPECIFIED ON THE PLANS. THE PATTERN SHALL BE SPECIFIED ON THE PLANS.
2. EXPANSION JOINT MAY BE NEEDED ON NON-CURB SIDE OF BRICK PAVER SIDEWALK IF THAT SIDE IS AGAINST BUILDING OR OTHER CONFINING FEATURE.

DELAWARE
DEPARTMENT OF TRANSPORTATION

PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER DETAILS

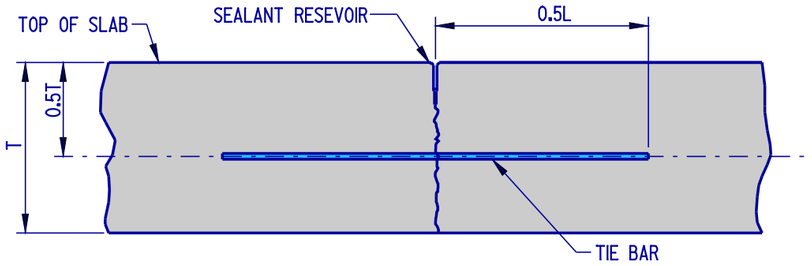
STANDARD NO. M-6 (2004) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

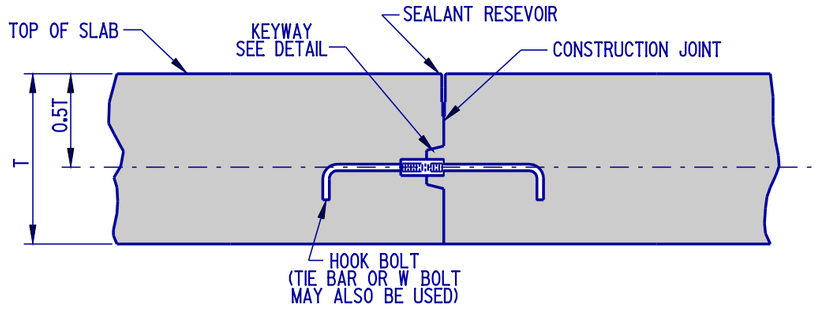
RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

09/24/2004

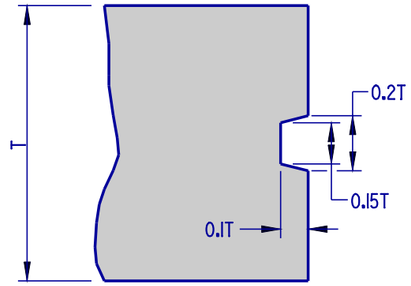
SCALE : N.T.S.



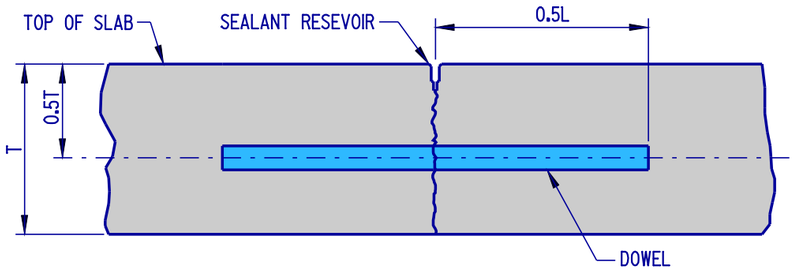

## LONGITUDINAL SAW-CUT JOINT DETAIL



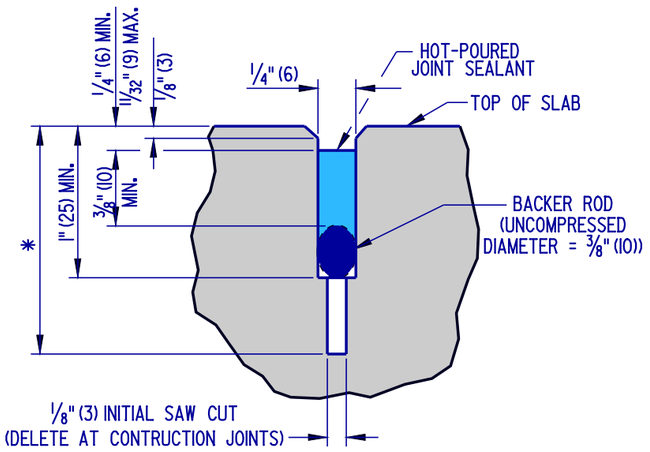

## LONGITUDINAL CONSTRUCTION JOINT DETAIL



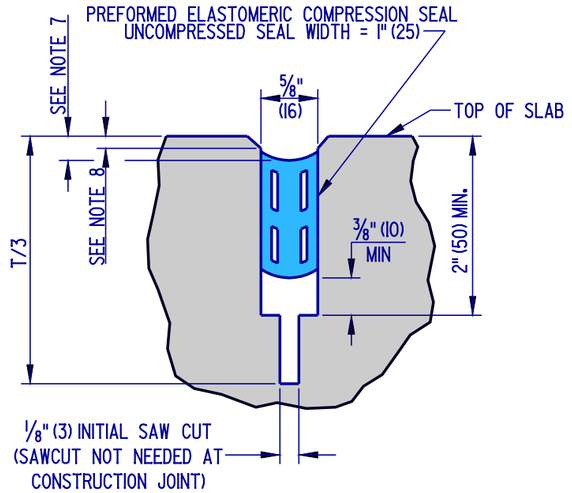

## KEYWAY DETAIL



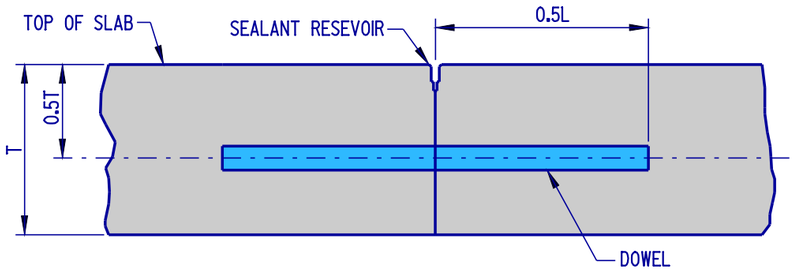

## TRANSVERSE SAW-CUT JOINT DETAIL




## SEALANT DETAIL- LONGITUDINAL JOINT




## SEALANT DETAIL- TRANSVERSE JOINT




## TRANSVERSE CONSTRUCTION JOINT DETAIL

* - 0.3T (10" (250) P.C.C. PAVEMENT)
0.4T (12" (300) P.C.C. PAVEMENT)

NOTES:

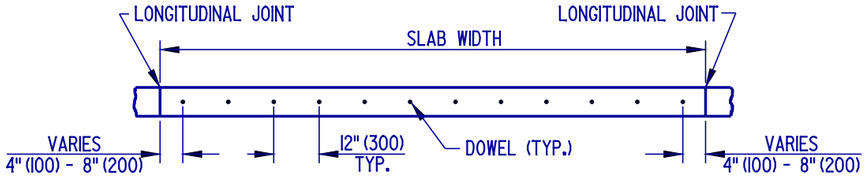
1). AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAVEMENT SURFACE IS BETWEEN 60°F (16°C) AND 80°F (27°C). WHEN THE TEMPERATURE IS BELOW 60°F (16°C), THE SEALANT RESERVOIR SHALL BE CUT 1/16" (2) WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F (27°C), THE SEALANT RESERVOIR SHALL BE CUT 1/16" (2) NARROWER.
2). "T" REFERS TO THE ACTUAL CONSTRUCTED SLAB THICKNESS.
3). TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT RANGES SHALL BE PLUS 1/16" (2), MINUS 0" (0).
4). THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR SHALL BE AT THE SAME ELEVATION.
5). TRANSVERSE JOINT MATERIAL SHALL BE PLACED BEFORE LONGITUDINAL JOINT MATERIAL; THE TRANSVERSE JOINT MATERIAL SHALL BE CONTINUOUS FOR THE FULL WIDTH OF ALL ADJACENT P.C.C. PAVEMENT SLABS.
6). LONGITUDINAL JOINT MATERIAL SHALL BE PLACED WITHOUT GAPS WHENEVER INTERRUPTED BY THE TRANSVERSE JOINT MATERIAL.
7). TRANSVERSE JOINT SEAL TO BE RECESSED 3/16" (5) TO 5/16" (8) BELOW THE TOP OF THE SLAB.
8). A 45° CHAMFER SHALL BE CUT 1/8" (3) TO 1/4" (6) DEEP AT THE TOP OF THE SLAB ALONG BOTH SIDES OF THE TRANSVERSE SEALANT RESERVOIR.
9). THE TOP EDGES OF THE COMPRESSION SEAL SHALL BE IN FULL CONTACT WITH THE SLAB SIDES.

## JOINT AND SEALANT DETAILS

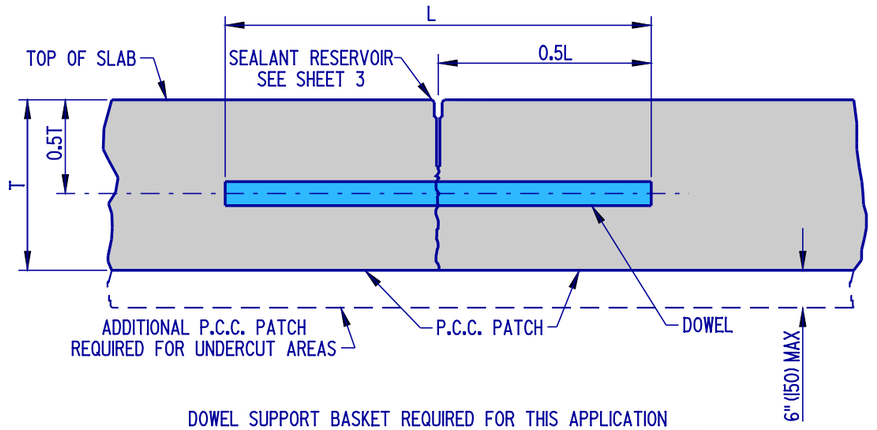
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | P.C.C. PAVEMENT | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. P-1 (2004) SHT. 2 OF 5 | RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE |

10/01/2004

SCALE : N.T.S.



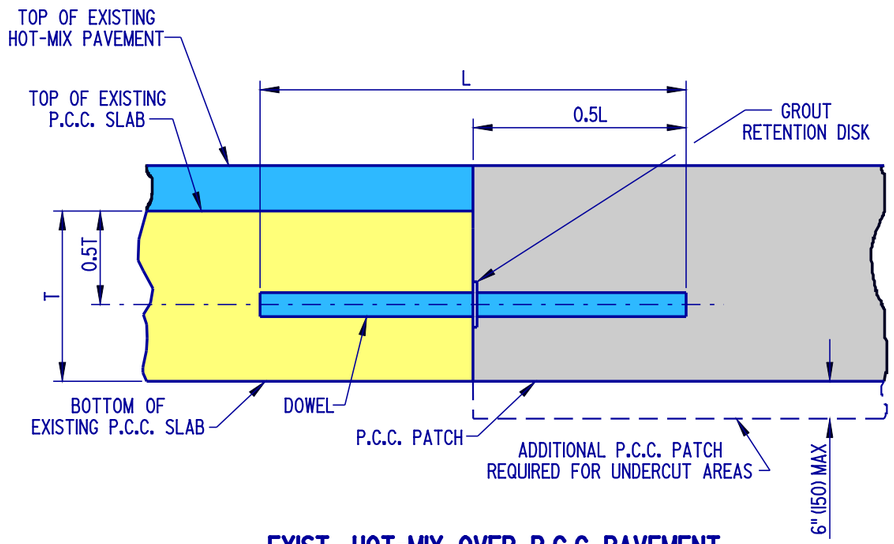

## SECTION A-A



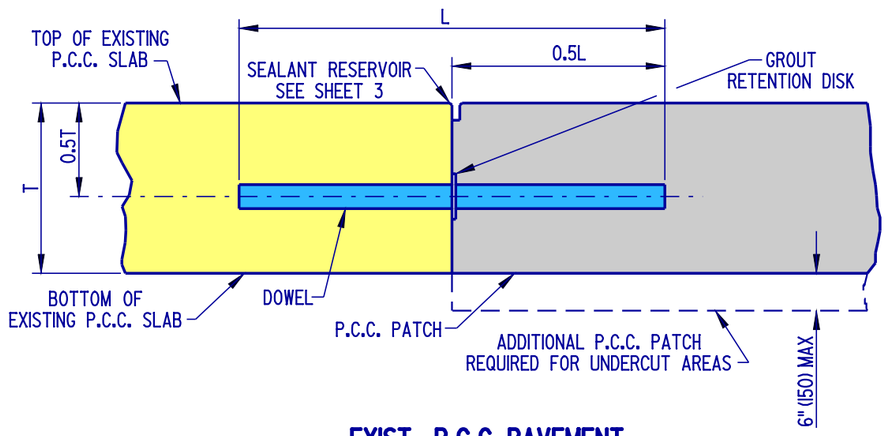

DOWEL SUPPORT BASKET REQUIRED FOR THIS APPLICATION
(REFER TO STANDARD CONSTRUCTION DETAIL FOR P.C.C. PAVEMENT.)

## SECTION B-B

TRANSVERSE SAW-CUT USED FOR
JOINTS LOCATED WITHIN THE PATCH




## EXIST. HOT-MIX OVER P.C.C. PAVEMENT




## EXIST. P.C.C. PAVEMENT

## SECTION C-C

TRANSVERSE CONSTRUCTION JOINT USED ON
JOINTS BETWEEN EXISTING PAVEMENT AND PATCH

# FULL DEPTH PATCH

DELAWARE
DEPARTMENT OF TRANSPORTATION

P.C.C. PAVEMENT PATCHING

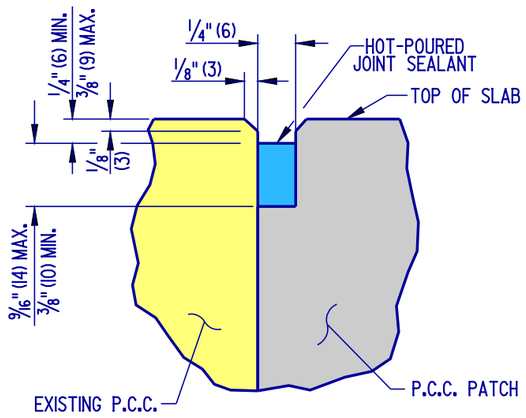
STANDARD NO. P-2 (2004) | SHT. 2 OF 5

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

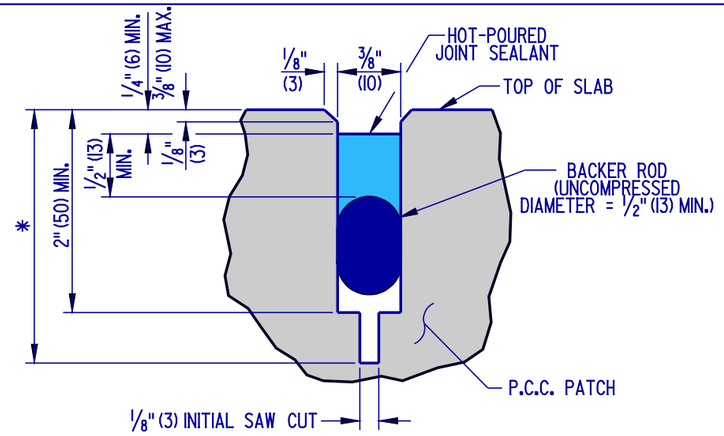
RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

08/25/2004

SCALE : N.T.S.

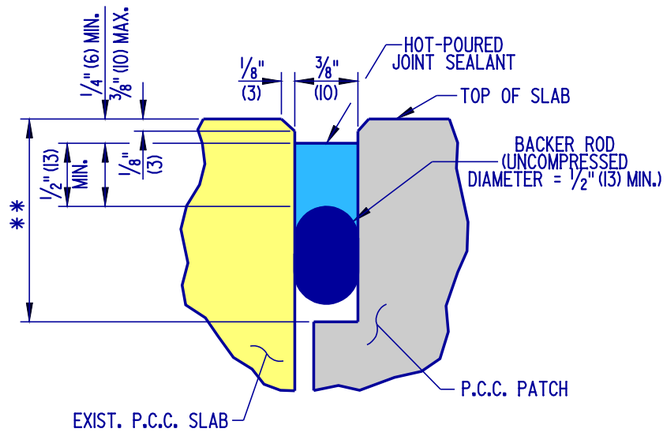



## SEALANT DETAIL- LONGITUDINAL JOINT



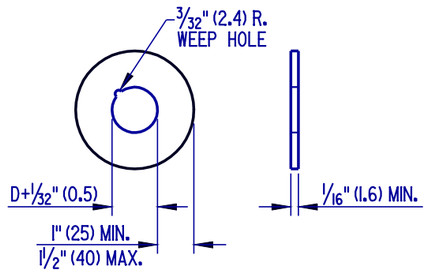

* - 0.3T (T ≤ 10" (250) P.C.C. PAVEMENT)
0.4T (T > 10" (250) P.C.C. PAVEMENT)

## SEALANT DETAIL- TRANSVERSE SAW-CUT JOINT



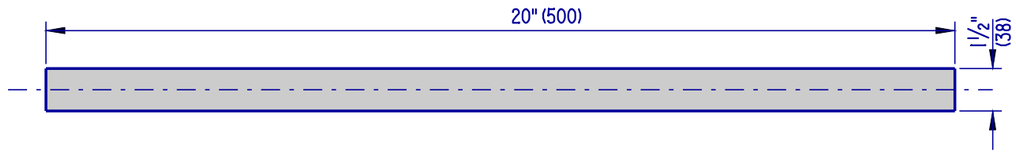

** - 2" (50) MIN. WITH BACKER ROD
5/8" (16) MIN. WITH BOND BREAKER TAPE

## SEALANT DETAIL- TRANSVERSE CONSTRUCTION JOINT




D - DOWEL DIAMETER (INCLUDING PROTECTING COATINGS, IF ANY.)

## GROUT RETENTION DISK




## DOWEL BAR

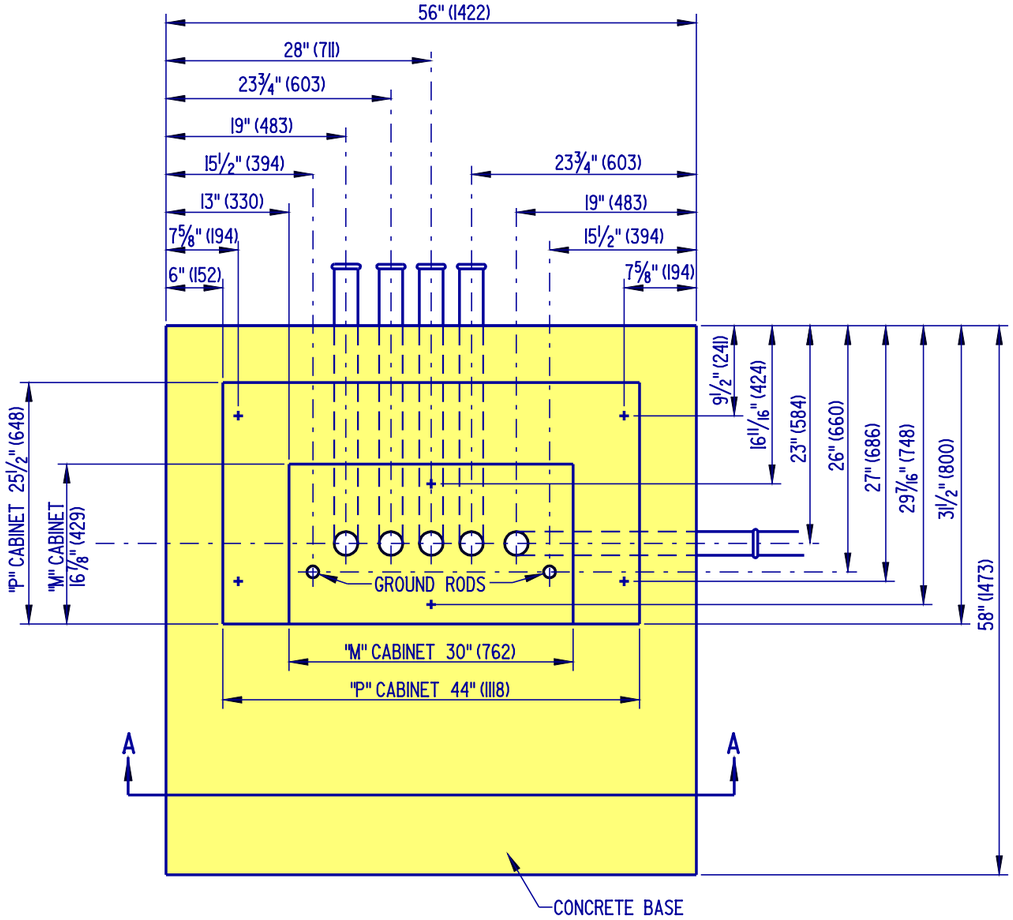
NOTES:
1). AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAVEMENT SURFACE IS BETWEEN 60°F (16°C) AND 80°F (27°C). WHEN THE TEMPERATURE IS BELOW 60°F (16°C), THE SEALANT RESERVOIR SHALL BE CUT 1/16" (2) WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F (27°C), THE SEALANT RESERVOIR SHALL BE CUT 1/16" (2) NARROWER.
2). "T" REFERS TO THE EXISTING "AS-BUILT" SLAB THICKNESS.
3). TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT RANGES SHALL BE PLUSS1/16" (2), MINUS 0" (0).
4). THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR SHALL BE AT THE SAME ELEVATION.

# FULL DEPTH PATCH

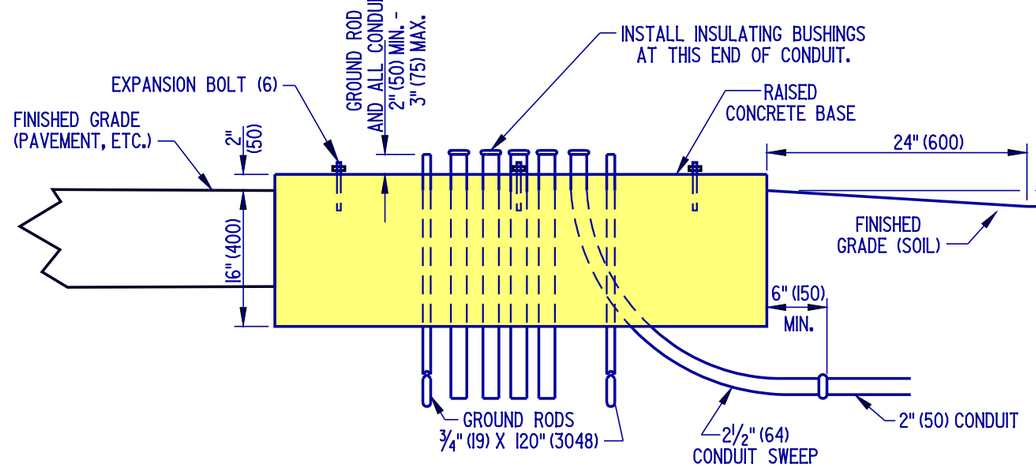
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | P.C.C. PAVEMENT PATCHING | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. P-2 (2004) | SHT. 3 OF 5 | RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE |

10/01/2004

SCALE : N.T.S.




PLAN VIEW




SECTION A-A

## CONCRETE CABINET BASE

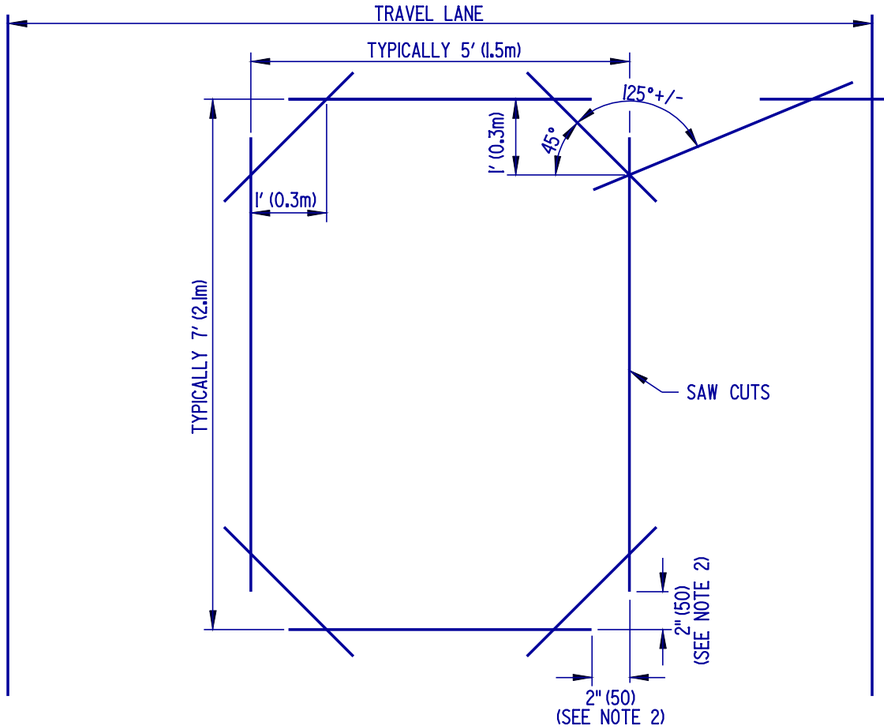
PLAN SYMBOL

CA
P

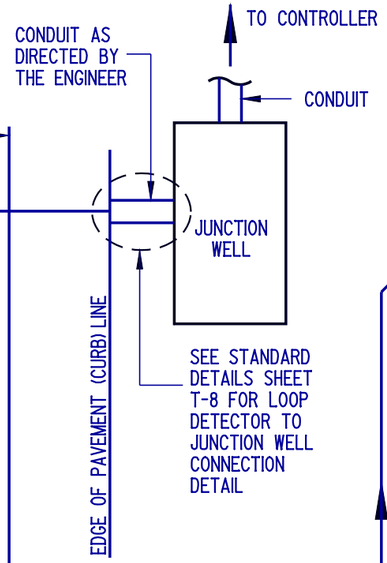
| DELAWARE DEPARTMENT OF TRANSPORTATION | CABINET BASES (TYPES 'M' & 'P') | | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|---|
| | STANDARD NO. T-4 (2004) | SHT. 1 | OF 1 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

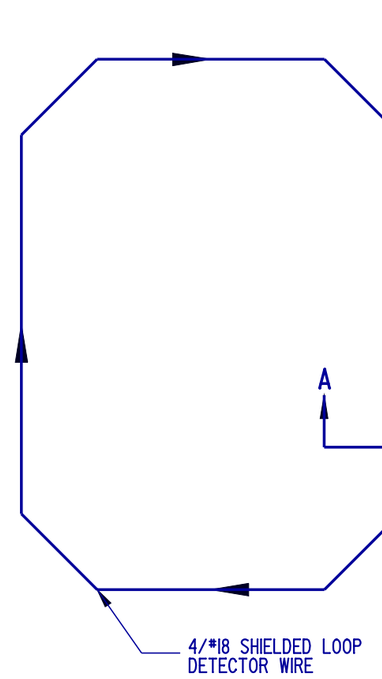
09/24/2004

SCALE : N.T.S.



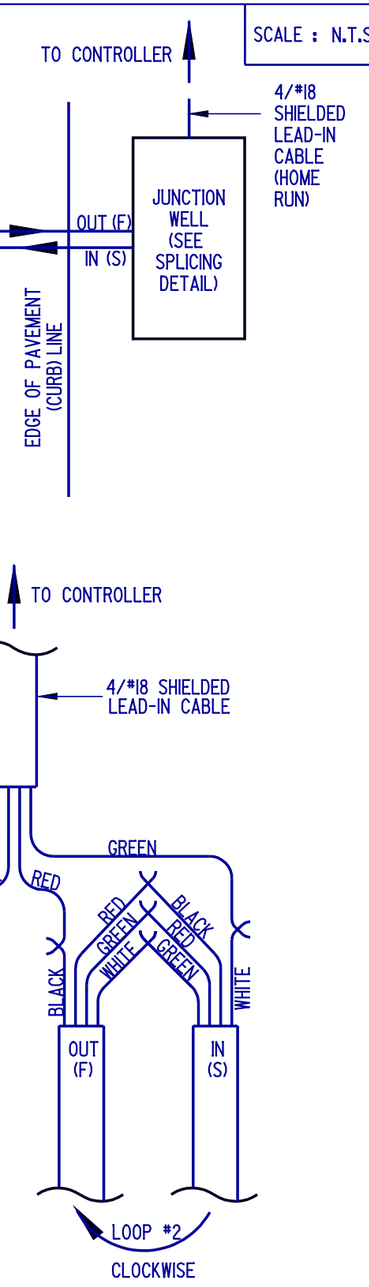

## WIRE SLOT CONSTRUCTION



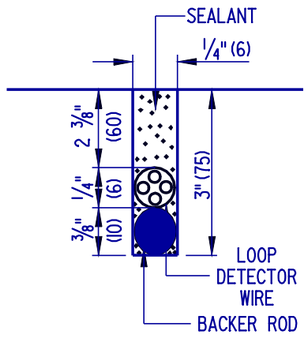

## DETAILS FOR INSTALLING LOOP DETECTOR WIRE

(SINGLE WRAP)

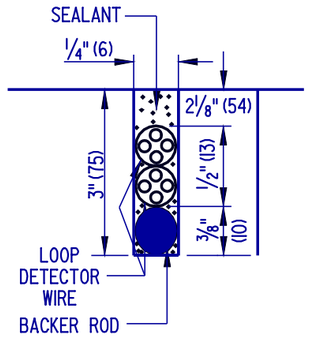



## SPLICING DETAIL

(SEE NOTE 3)




## SECTION A - A




## SECTION B - B

**NOTES:**

1). SAW CUTS FOR WIRE SLOT CONSTRUCTION SHALL BE EXTENDED BEYOND THE CORNERS SO THAT THE SLOT IS FULL DEPTH AT TURN POINTS. A FORTY-FIVE (45) DEGREE ANGLE SHALL BE CUT 12" (300) BACK FROM THE POINT OF THE EXTENDED CORNER.
2). THE DIAGONAL CUT SHALL BE STOPPED APPROXIMATELY 2" (50) FROM THE CORNER TO PREVENT THE TRIANGULAR PORTION OF THE PAVEMENT FROM BREAKING.
3). A MAXIMUM OF TWO LOOP DETECTORS CAN BE SPLICED TO ONE LEAD-IN CABLE, THE DETAIL ILLUSTRATES THE METHOD OF SPLICING TWO LOOP DETECTORS (LOOP #1 AND LOOP #2) TO A LEAD-IN CABLE.
4). LOOP DETECTOR SHALL BE CENTERED IN TRAVEL LANE.

## PLAN SYMBOL

DELAWARE
DEPARTMENT OF TRANSPORTATION

**TYPE #1 LOOP DETECTOR**

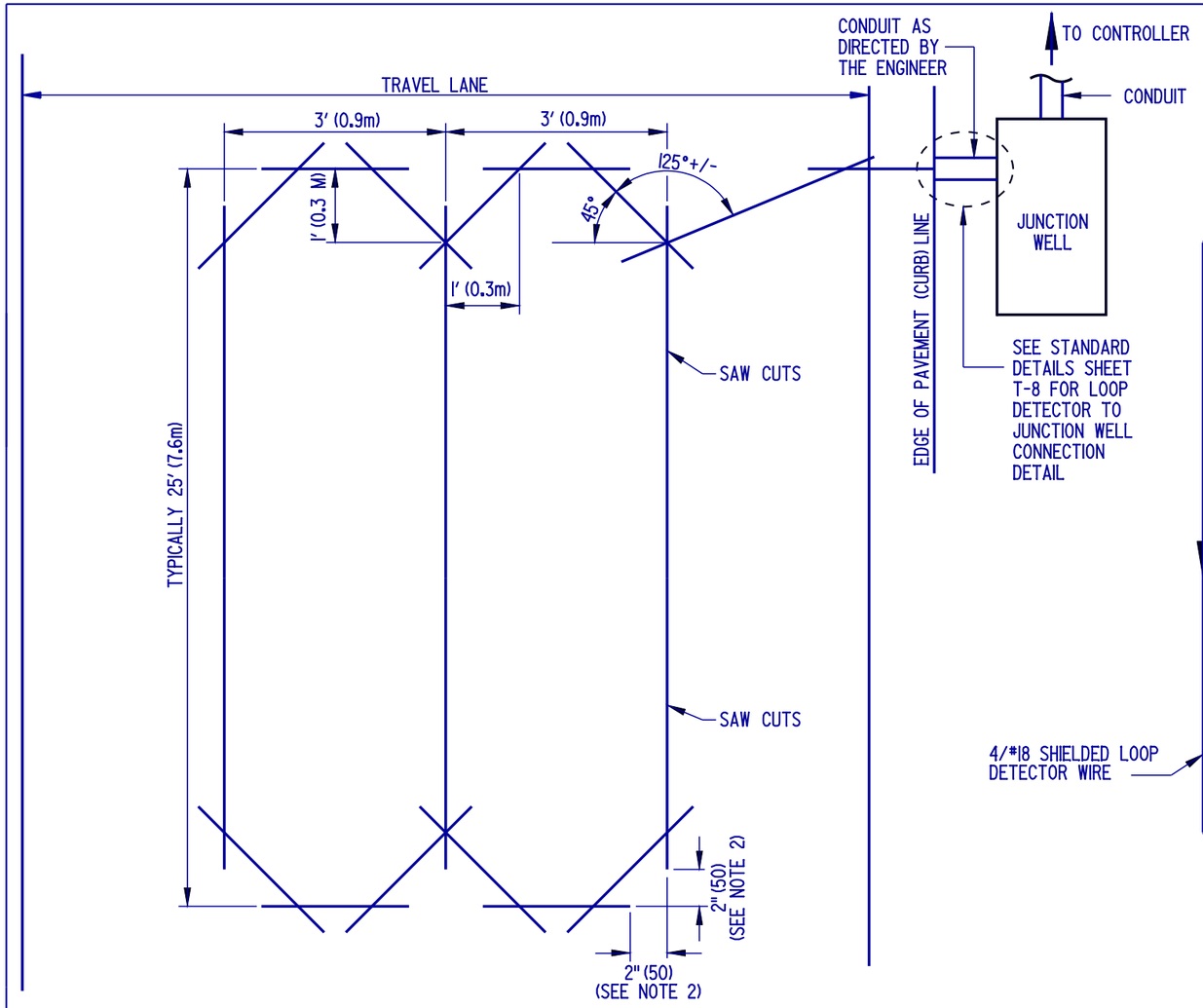
STANDARD NO. T-9 (2004) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/27/2004

SCALE : N.T.S.




## WIRE SLOT CONSTRUCTION

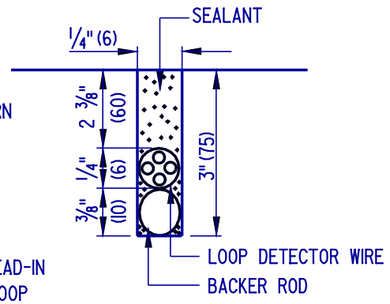
**NOTES:**

1). SAW CUTS FOR WIRE SLOT CONSTRUCTION SHALL BE EXTENDED BEYOND THE CORNERS SO THAT THE SLOT IS FULL DEPTH AT TURN POINTS. A FORTY-FIVE (45) DEGREE ANGLE SHALL BE CUT 1' (0.3m) BACK FROM THE POINT OF THE EXTENDED CORNER.

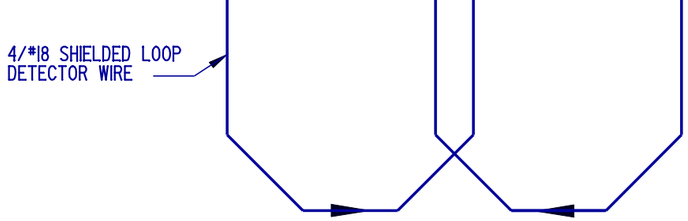
2). THE DIAGONAL CUT SHALL BE STOPPED APPROXIMATELY 2" (50) FROM THE CORNER TO PREVENT THE TRIANGULAR PORTION OF THE PAVEMENT FROM BREAKING.

3). A MAXIMUM OF TWO LOOP DETECTORS CAN BE SPLICED TO ONE LEAD-IN CABLE. THE DETAIL ILLUSTRATES THE METHOD OF SPLICING TWO LOOP DETECTORS (LOOP #1 AND LOOP #2) TO A LEAD-IN CABLE.

4). LOOP DETECTOR SHALL BE CENTERED IN TRAVEL LANE.

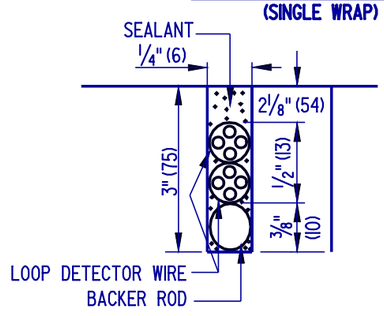



## SECTION A - A

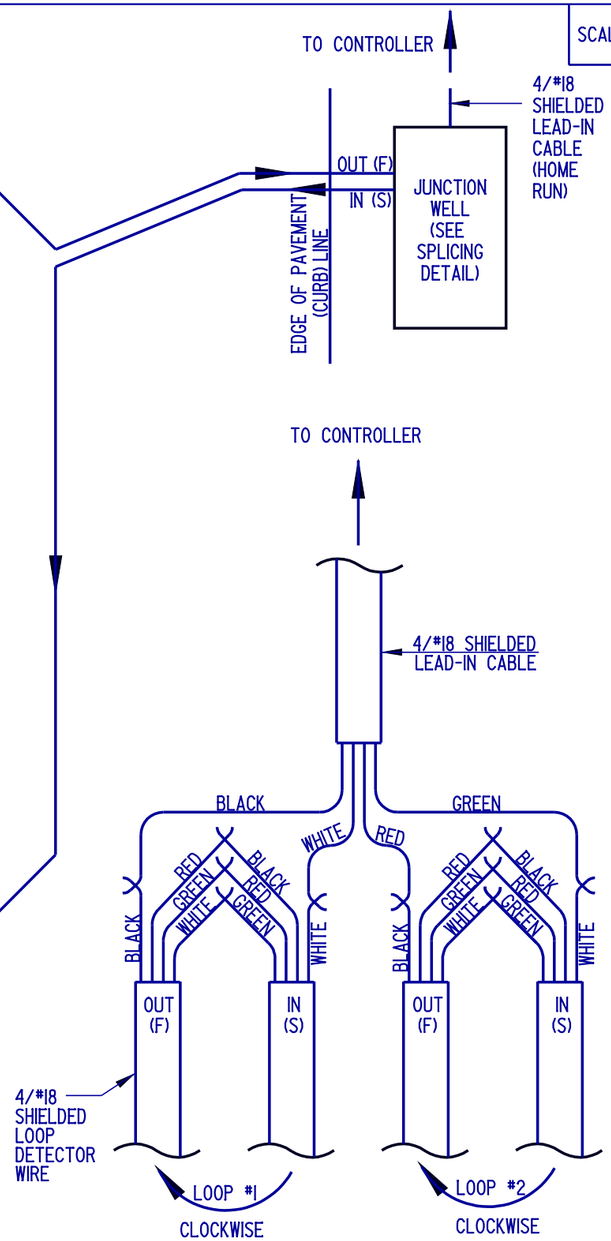



## DETAILS FOR INSTALLING LOOP DETECTOR WIRE

(SINGLE WRAP)




## SECTION B - B




## SPLICING DETAIL

(SEE NOTE 3)

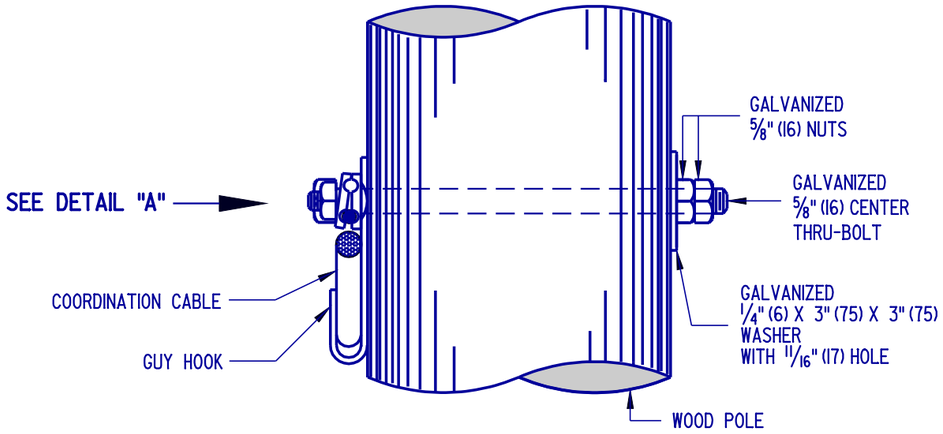
## PLAN SYMBOL

| DELAWARE DEPARTMENT OF TRANSPORTATION | TYPE #2 LOOP DETECTOR | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. T-10 (2004) | SHT. 1 OF 1 | RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE |

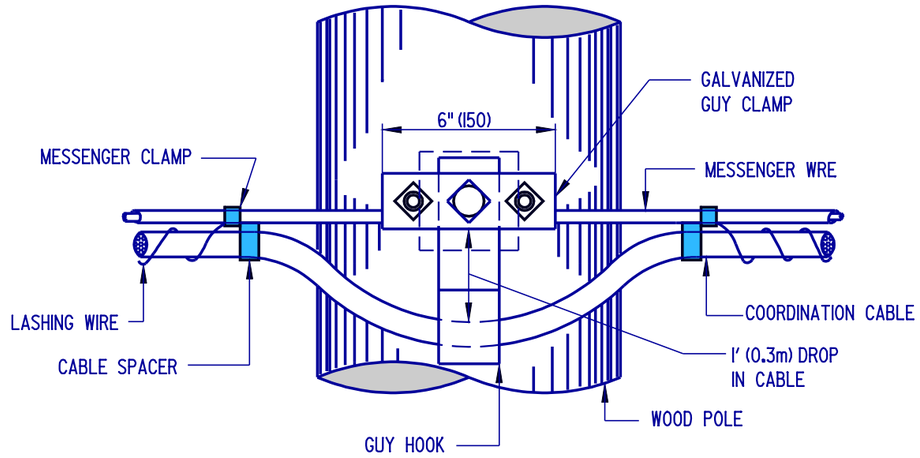
10/14/2004

SCALE : N.T.S.

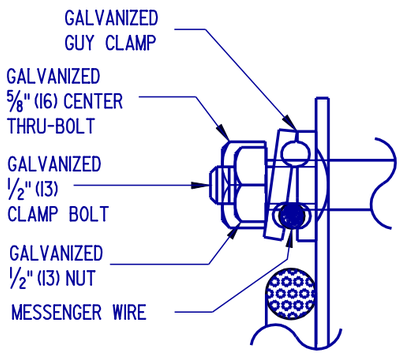
## INTERMEDIATE



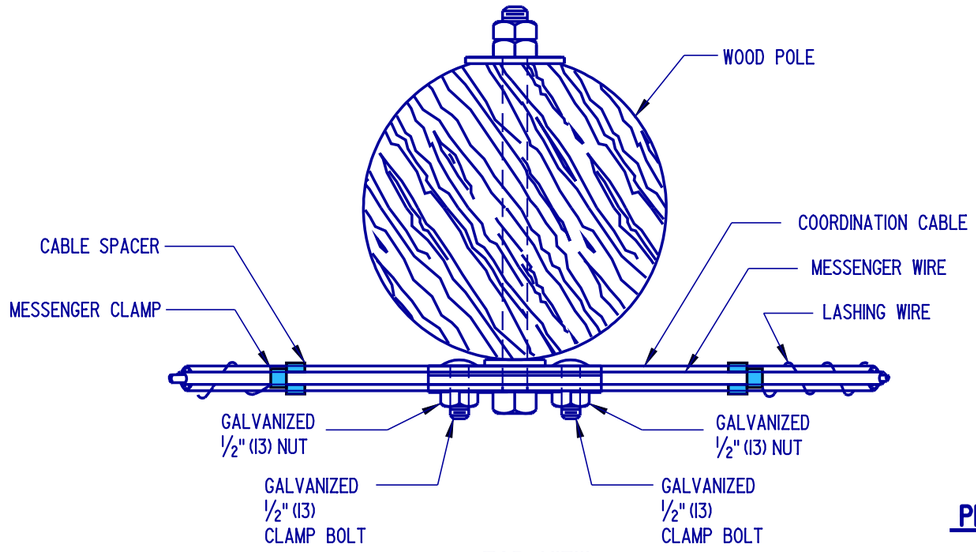

SIDE VIEW




FRONT VIEW




DETAIL "A"




TOP VIEW

PLAN SYMBOL

—C—●—C—

DELAWARE
DEPARTMENT OF TRANSPORTATION

INTERMEDIATE MESSENGER WIRE ATTACHMENT ON WOOD POLES

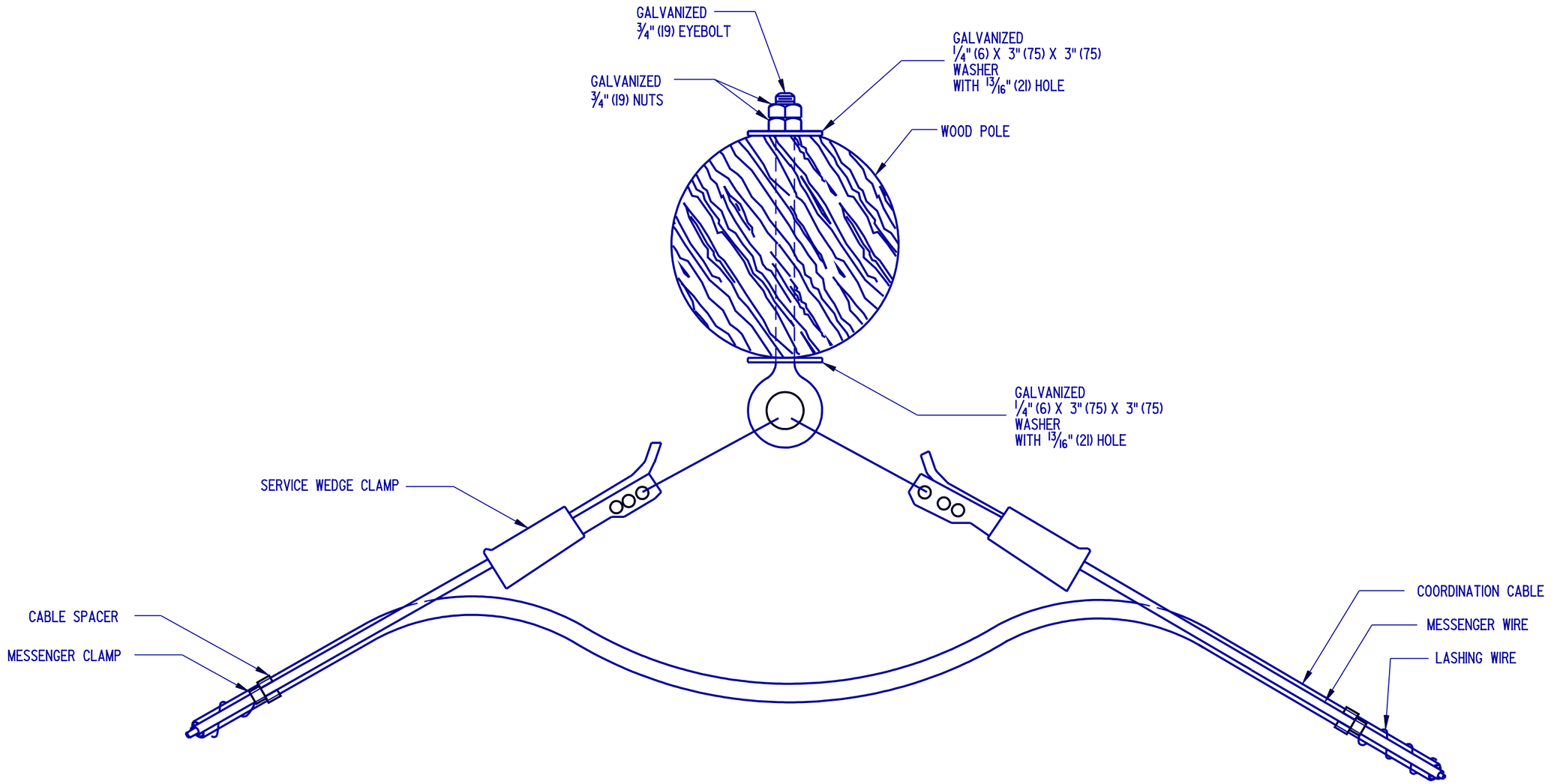
STANDARD NO. T-11 (2004) | SHT. 1 OF 2

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/27/2004

SCALE : N.T.S.



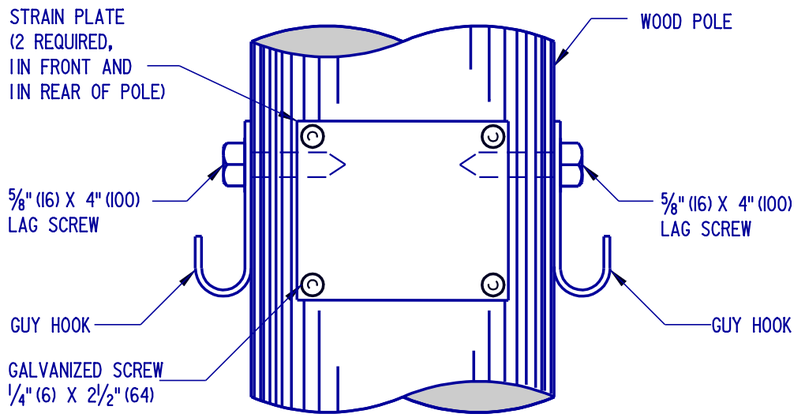

**TOP VIEW**

**PLAN SYMBOL**

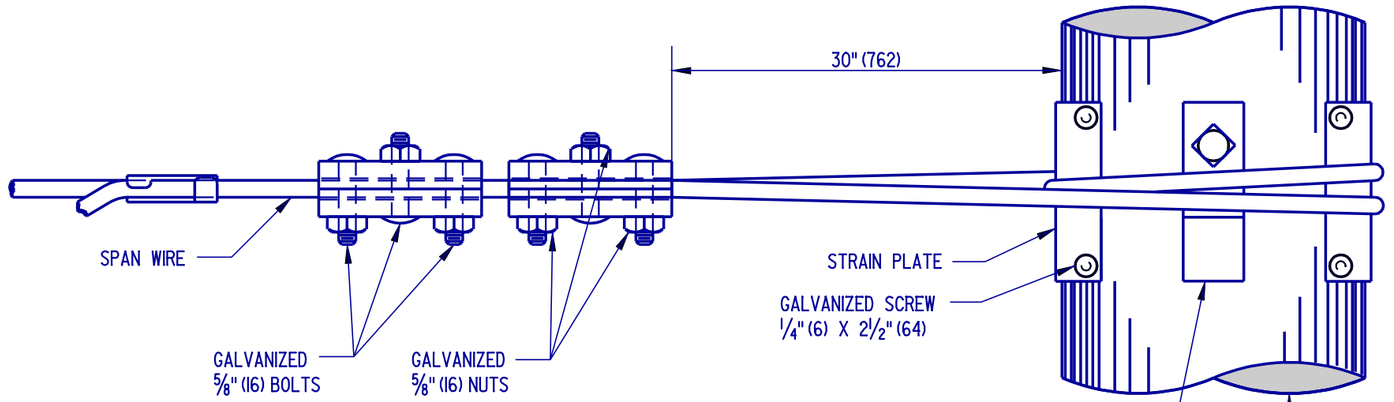

| DELAWARE DEPARTMENT OF TRANSPORTATION | ANGULAR INTERMEDIATE MESSENGER WIRE ATTACHMENT | | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
|---|---|---|---|
| | STANDARD NO. T-11 (2004) | SHT. 2 OF 2 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/27/2004

SCALE : N.T.S.




**FRONT VIEW**
(SPAN WIRE NOT SHOWN)




**SIDE VIEW**




**MATCH LINE A - A**




**TOP VIEW**

**MATCH LINE A - A**

**NOTE:** SPAN WIRE ATTACHMENT BETWEEN METAL POLES IS THE SAME AS SHOWN FOR WOOD POLES EXCEPT THAT THE STRAIN PLATES AND GUY HOOKS ARE NOT USED. FOR DETAIL SEE T-14 SHEET 2 - "DEAD END MESSENGER WIRE ATTACHMENT, METAL POLES ".

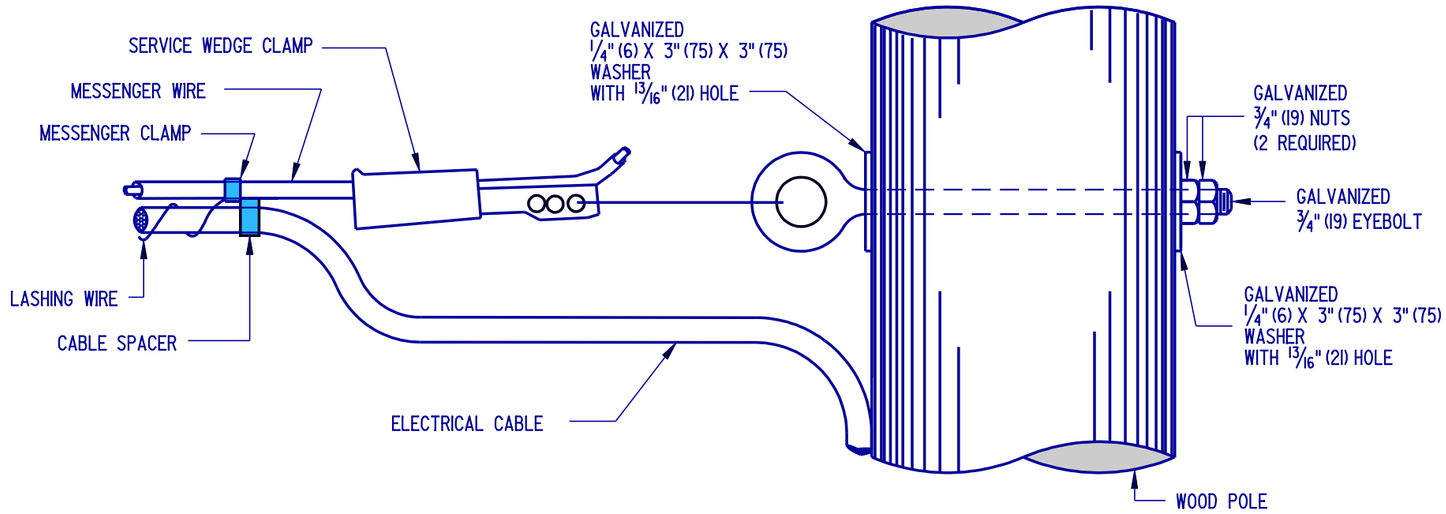
**PLAN SYMBOL**

—X—⊙

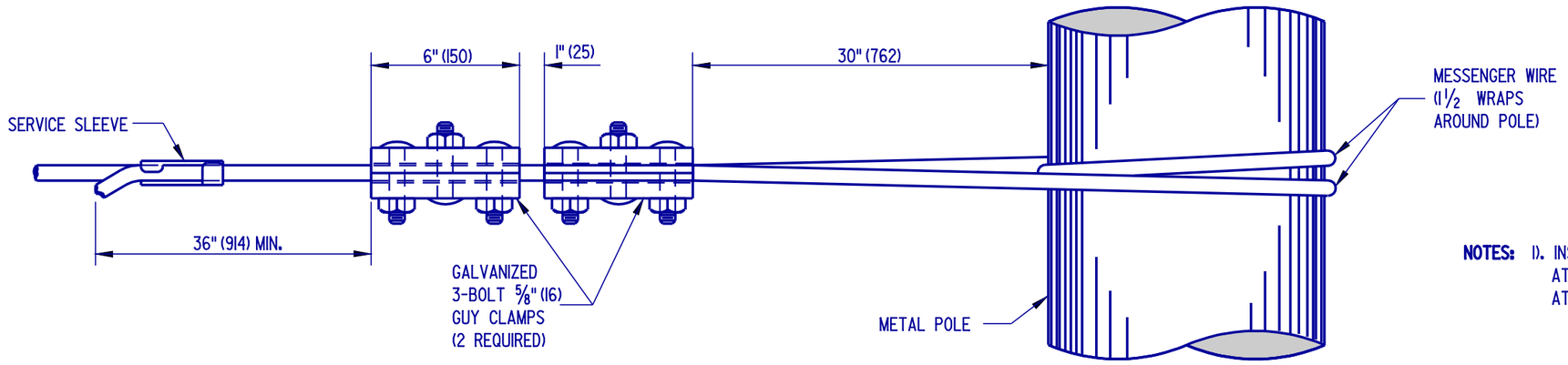
| | | |
|---|---|---|
| **DELAWARE DEPARTMENT OF TRANSPORTATION** | **SPAN WIRE ATTACHMENT BETWEEN POLES** | **APPROVED** Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | **STANDARD NO. T-12 (2004)** **SHT. 1 OF 2** | **RECOMMENDED** Dennis M. Office DESIGN ENGINEER 1/3/05 DATE |

09/21/2004

SCALE : N.T.S.




## WOOD POLES




**NOTES:** 1). INSTALLATION METHOD SHOWN FOR DEAD END MESSENGER WIRE ATTACHMENT TO METAL POLES SHALL BE USED FOR SPAN WIRE ATTACHMENT BETWEEN METAL POLES.

**PLAN SYMBOL**

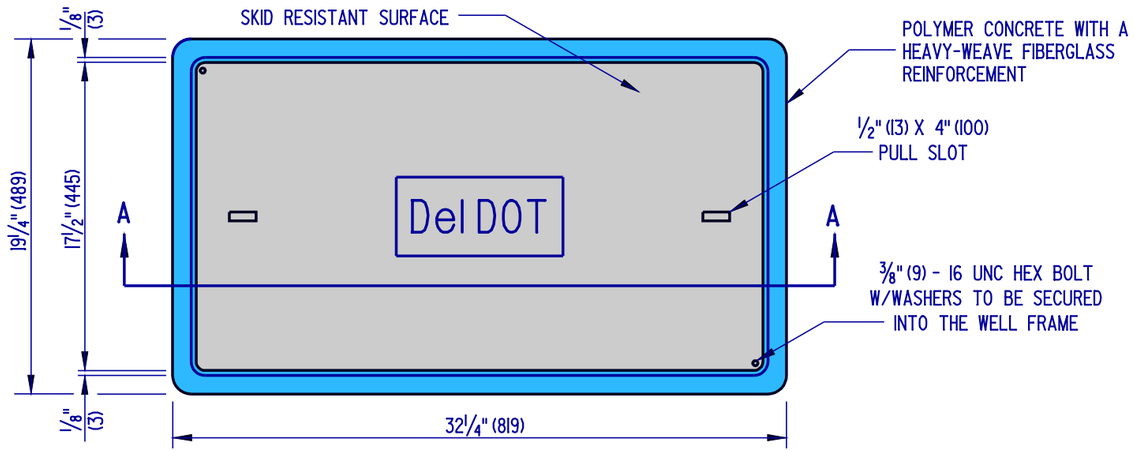
—X—⊙

## METAL POLES

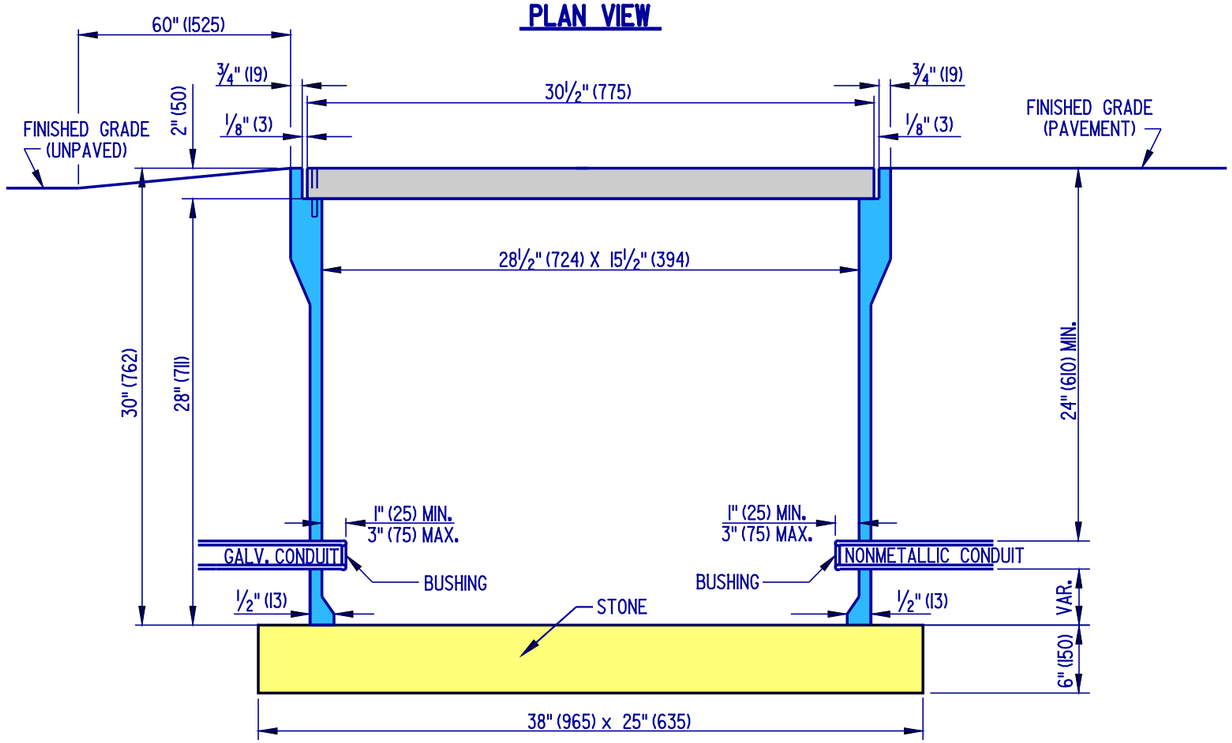
| | | |
|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | DEAD END MESSENGER WIRE ATTACHMENT | APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE |
| | STANDARD NO. T-12 (2004) SHT. 2 OF 2 | RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE |

09/27/2004

SCALE : N.T.S.




## PLAN VIEW




## SECTION A-A

**NOTES:**

1). TYPE 6 CONDUIT JUNCTION WELL SHALL BE PRECAST POLYMER CONCRETE.

2). ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.

3). POLYMER CONCRETE COVERS SHALL BE THE HEAVY-DUTY TYPE WITH A DESIGN LOAD OF 15,000 LBS (6800 kg) OVER A 10" (255) SQUARE.

## PLAN SYMBOL

DELAWARE
DEPARTMENT OF TRANSPORTATION

CONDUIT JUNCTION WELL, TYPE 4

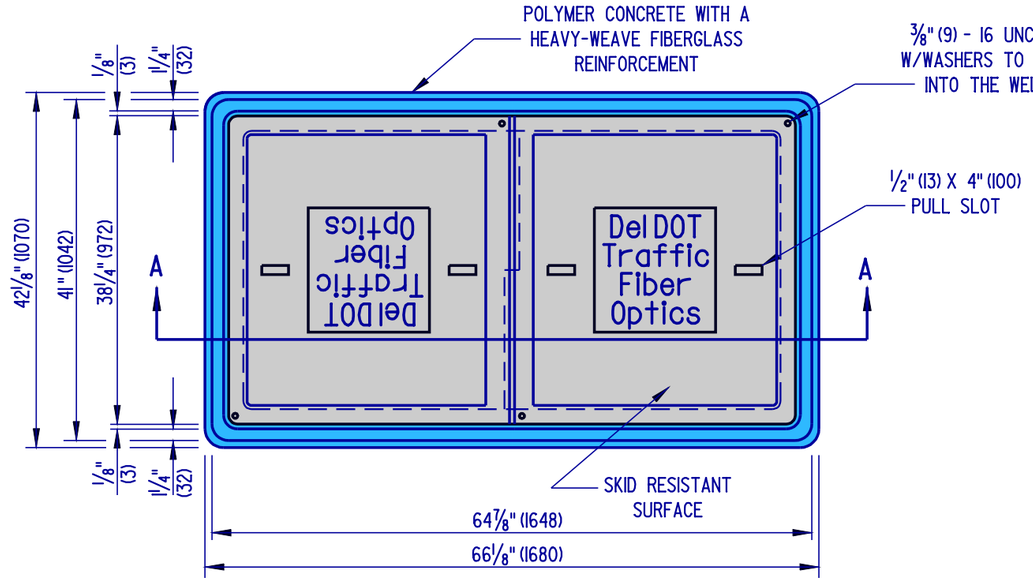
STANDARD NO. T-13 (2004) | SHT. 1 OF 3

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

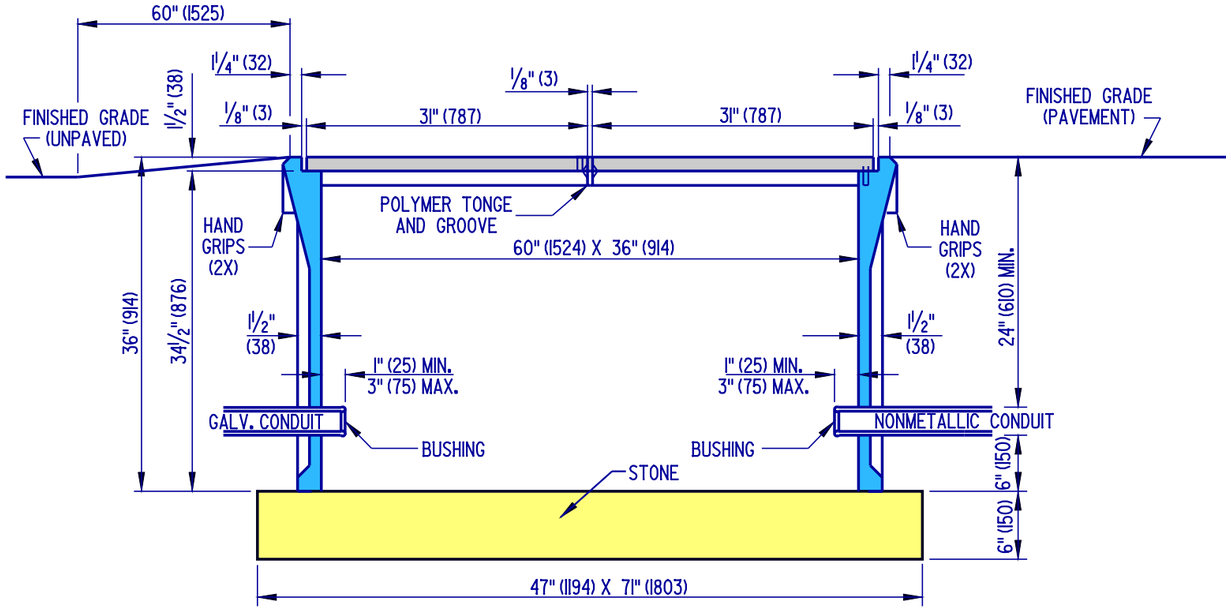
RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

09/27/2004

SCALE : N.T.S.




## PLAN VIEW




## SECTION A-A

**NOTES:**

1). TYPE 7 CONDUIT JUNCTION WELL SHALL BE PRECAST POLYMER CONCRETE.

2). ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.

3). POLYMER CONCRETE COVERS SHALL BE THE HEAVY DUTY TYPE WITH A DESIGN LOAD OF 15,000 LBS (6800 kg) OVER A 10" (255) SQUARE.

**PLAN SYMBOL**

DELAWARE
DEPARTMENT OF TRANSPORTATION

CONDUIT JUNCTION WELL, TYPE 7

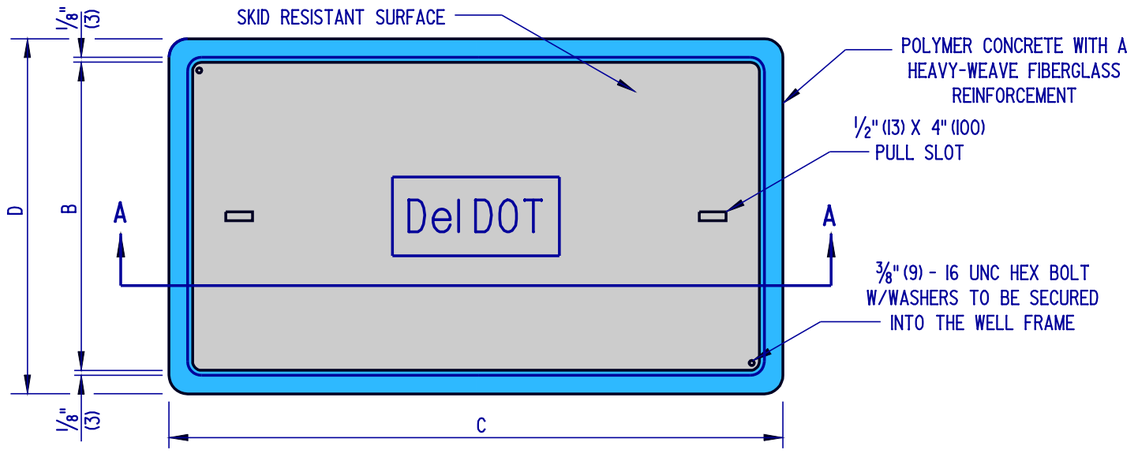
STANDARD NO. T-13 (2004) | SHT. 2 OF 3

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

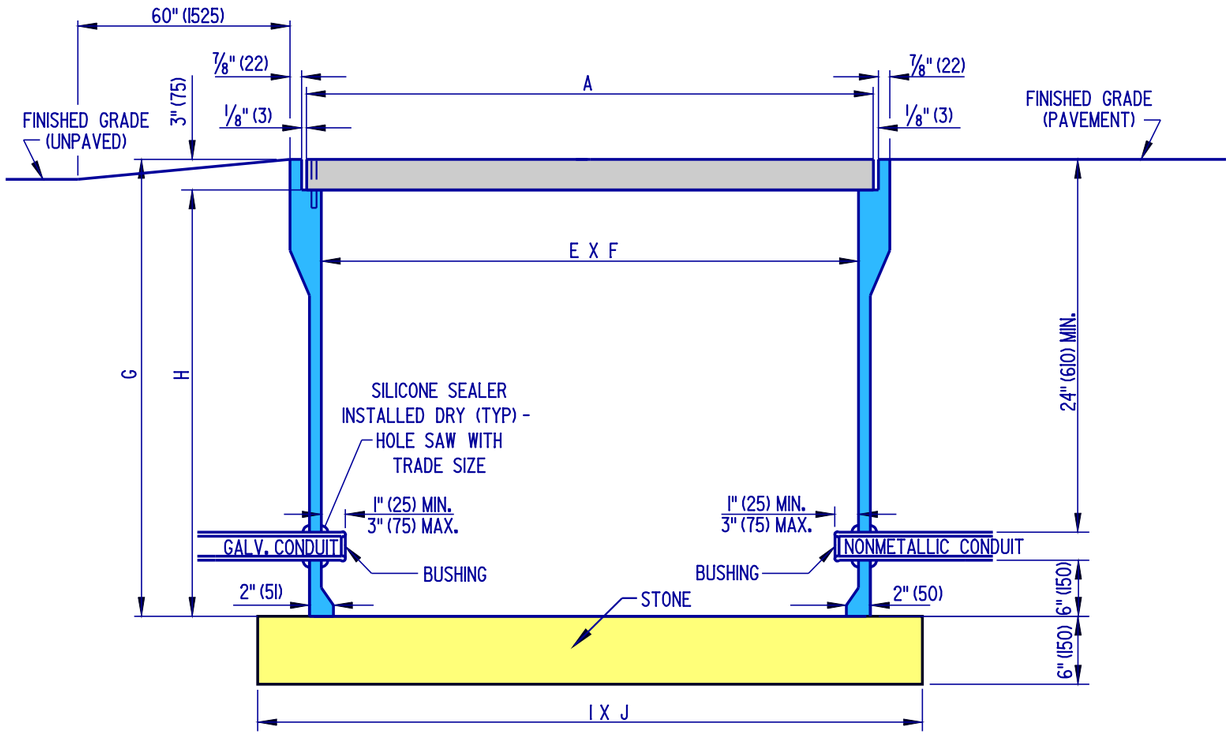
RECOMMENDED Dennis M. Office DESIGN ENGINEER 1/3/05 DATE

09/21/2004

SCALE : N.T.S.




**PLAN VIEW**




**SECTION A-A**

**NOTES:**

1). TYPES 8 & 10 CONDUIT JUNCTION WELLS SHALL BE PRECAST POLYMER CONCRETE.
2). ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
3). POLYMER CONCRETE COVERS SHALL BE THE HEAVY-DUTY TYPE WITH A DESIGN LOAD OF 15,000 LBS (6800 kg) OVER A 10" (255) SQUARE.

| DIMENSIONS | | TYPE 8 | TYPE 10 |
|---|---|---|---|
| COVER | A | 47 5/8" (1210) | 35 5/8" (905) |
| | B | 30 1/8" (765) | 24" (610) |
| FRAME | C | 49 5/8" (1261) | 37 5/8" (956) |
| | D | 32 1/8" (816) | 26" (660) |
| | E | 45 5/8" (1159) | 33 7/8" (860) |
| | F | 28 1/8" (714) | 22 1/4" (565) |
| | G | 36" (914) | 30" (1067) |
| | H | 33" (838) | 27" (991) |
| BASE | I | 58" (1473) | 46" (1168) |
| | J | 40" (1016) | 34" (864) |

**PLAN SYMBOL**

DELAWARE
DEPARTMENT OF TRANSPORTATION

CONDUIT JUNCTION WELLS, TYPES 8 & 10

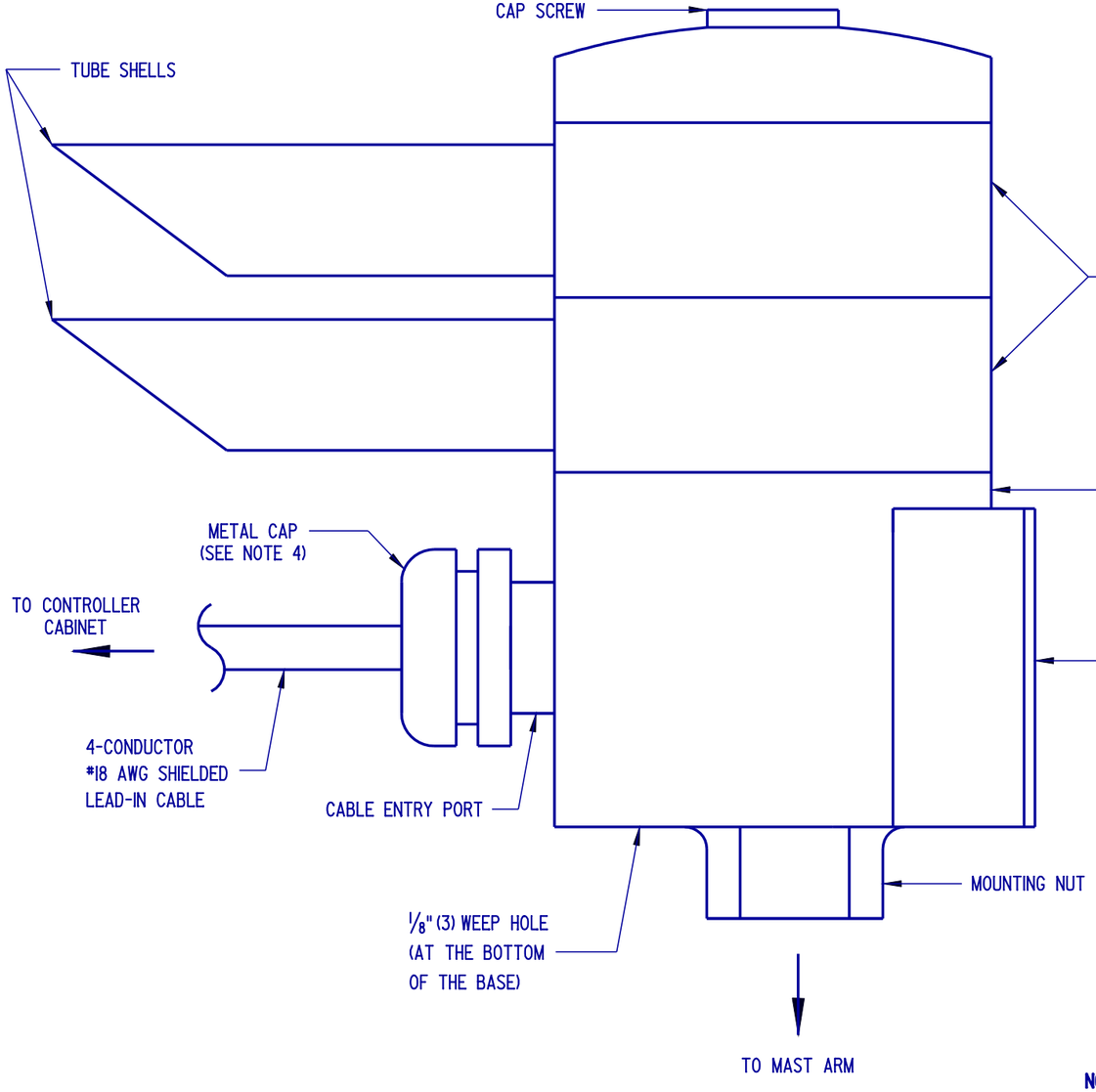
STANDARD NO. T-13 (2004) | SHT. 3 OF 3

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

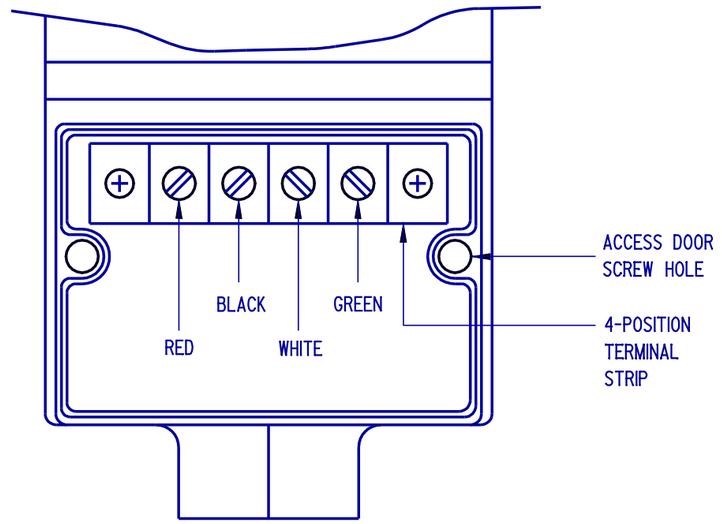
08/02/2004

SCALE : N.T.S.




SIDE VIEW

## CABLE CONNECTIONS TO TERMINAL STRIP




FRONT VIEW
(CABLE IS NOT SHOWN)

**NOTES:**

1). UPRIGHT CONFIGURATION SHALL BE USED FOR MOUNTING ON MAST ARMS, SIGNAL HEAD FRAMEWORKS AND PEDESTALS.
2). UPRIGHT MOUNTING HARDWARE SHALL BE SUPPLIED BY THE DEPARTMENT.
3). TEFLON TAPE SHALL BE APPLIED TO THREADS BEFORE MOUNTING.
4). ROUTE THE LEAD-IN CABLE THROUGH THE METAL CAP AND THE RUBBER PLUG. REPLACE THE METAL CAP, SEALING THE CABLE ENTRY PORT. TIGHTEN THE METAL CAP SO THE CABLE WILL NOT SLIDE THROUGH THE RUBBER PLUG.

PLAN SYMBOL

DELAWARE
DEPARTMENT OF TRANSPORTATION

EMERGENCY PREEMPTION RECEIVER, UPRIGHT MOUNT

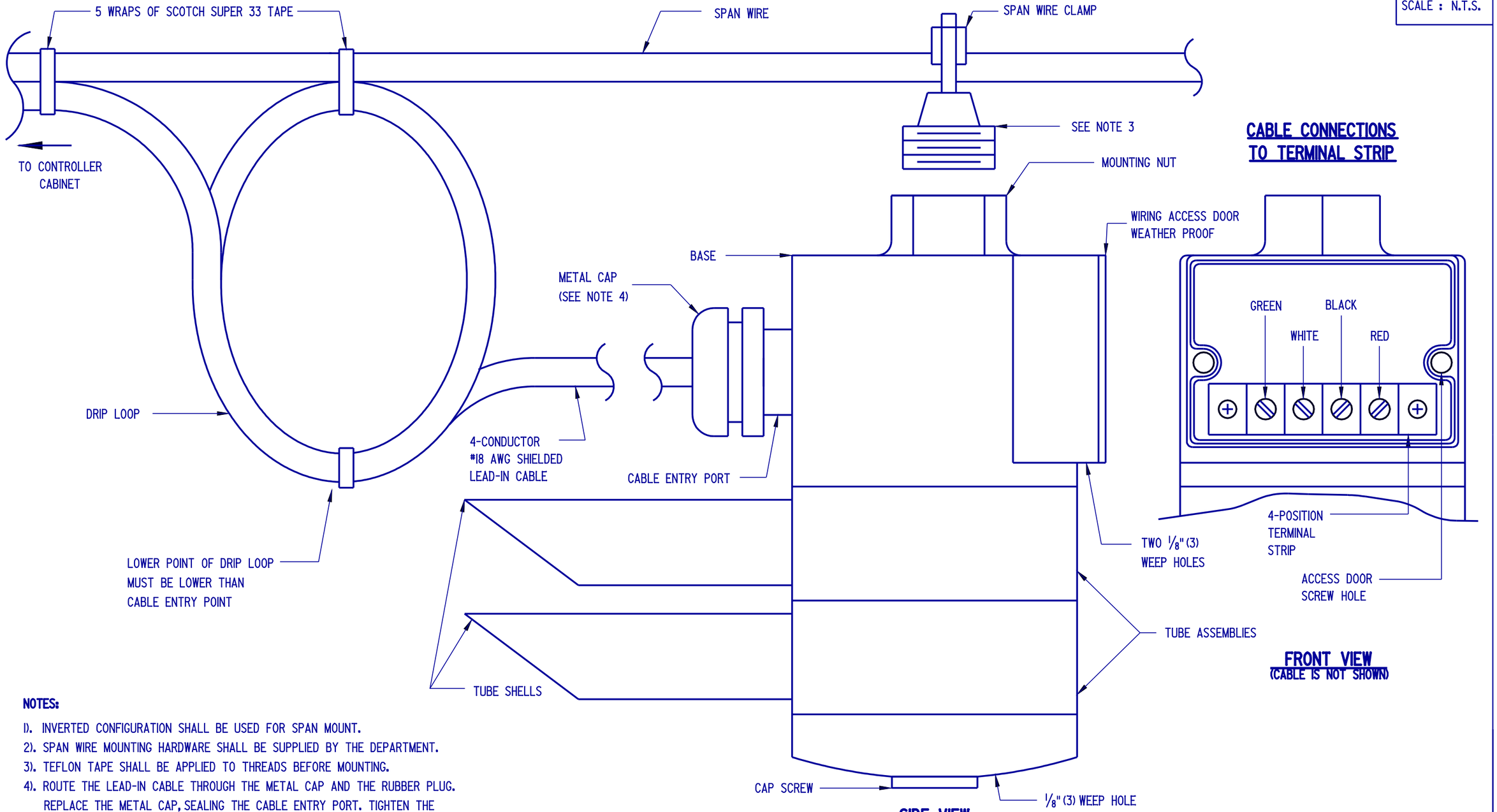
STANDARD NO. T-14 (2004) | SHT. 1 OF 2

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. O'Toole DESIGN ENGINEER 1/3/05 DATE

08/02/2003

SCALE : N.T.S.




## CABLE CONNECTIONS TO TERMINAL STRIP

**NOTES:**

1). INVERTED CONFIGURATION SHALL BE USED FOR SPAN MOUNT.
2). SPAN WIRE MOUNTING HARDWARE SHALL BE SUPPLIED BY THE DEPARTMENT.
3). TEFLON TAPE SHALL BE APPLIED TO THREADS BEFORE MOUNTING.
4). ROUTE THE LEAD-IN CABLE THROUGH THE METAL CAP AND THE RUBBER PLUG. REPLACE THE METAL CAP, SEALING THE CABLE ENTRY PORT. TIGHTEN THE METAL CAP SO THE CABLE WILL NOT SLIDE THROUGH THE RUBBER PLUG.

**PLAN SYMBOL**

DELAWARE
DEPARTMENT OF TRANSPORTATION

EMERGENCY PREEMPTION RECEIVER, INVERTED MOUNT

STANDARD NO. T-14 (2004) | SHT. 2 OF 2

APPROVED Carolann Wicks CHIEF ENGINEER 1/10/05 DATE

RECOMMENDED Dennis M. Oftha DESIGN ENGINEER 1/3/05 DATE

09/28/2004